

A REVISION OF THE TURRIDÆ (PLEUROTOMIDÆ) OCCURRING IN  
THE PERSIAN GULF, GULF OF OMAN, AND NORTH ARABIAN  
SEA, AS EVIDENCED MOSTLY THROUGH THE RESULTS OF  
DREDGINGS CARRIED OUT BY MR. F. W. TOWNSEND, 1893-1914.

By JAMES COSMO MELVILL, M.A., D.Sc., F.L.S., etc.

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PLATES VIII-X.

THE comprehensive study of the marine molluscan fauna of the Persian Gulf and its contiguous seas is of comparatively recent date, hardly any steps having been taken to classify or enumerate the members of the richest family occurring within that area, until 1875, when Messrs. Geoffrey and Hugh Nevill published an account of "New Marine Mollusca from the Indian Ocean, mostly Pleurotomidæ".<sup>1</sup> In this treatise about twenty-five species are named, but many of them occur beyond our assigned limits. These were all well described, but only fairly figured on the whole. Two years later, in 1877, Mr. Edgar Smith began his "Diagnosis of new species of Pleurotomidæ" in the British Museum,<sup>2</sup> and a series of papers followed, which were not completed till October, 1888. Very unfortunately, but owing to no fault of the author, who always spoke regretfully to me of the circumstances, none of them were figured. Over 160 species were diagnosed, and the types noted. During the past five or six years a few of them have been illustrated, either by Mr. C. Hedley<sup>3</sup> or myself,<sup>4</sup> but only a very few, and there can be no concealing of the fact that a great stumbling-block to the student has been occasioned by this omission. Many times I had discussed this question with Mr. Smith, and had resolved to delineate all that came from this particular province, from the actual types, and I find that thirty-five (or one-fifth of the total) of his species can be included.

I therefore venture to offer now the three plates accompanying this paper, as some slight memorial of one to whom molluscan science owes so much, and whose unvarying kindness, attention, and readiness to assist in every possible way those who asked his advice and help, so endeared the name of Edgar Albert Smith to all.

To discover these types I have been several times through the amassed stores of this family in the cases and drawers of the cabinets at the Museum, and only in two instances have I so far failed to find the objects of my search.

<sup>1</sup> Journ. As. Soc. Bengal, vol. xlv, pt. ii, 1875, pp. 83-94, pls. vii-viii.

<sup>2</sup> Ann. Mag. Nat. Hist., ser. iv, vol. xix, 1877, pp. 488-501; ser. v, vol. x, 1882, pp. 200-18, 296-306; ser. v, vol. xiv, 1884, pp. 317-29; ser. v, vol. xviii, 1888, pp. 300-17.

<sup>3</sup> Mem. Austral. Mus., iv, pt. vi, 1903, p. 389.

<sup>4</sup> Proc. Zool. Soc. Lond., 1901, ii, pl. xxi, figs. 4, 14; Proc. Malac. Soc. Lond., vol. x, 1912, p. 251, pl. xi, f. 13, 13a.

I may add that more than 180 species are treated of in this paper, and one-half of them have been described as new, mainly from Mr. Townsend's collections. The types are all in the British Museum. The Turridæ (Bolten's name *Turris*, 1798, antedating Lamarck's *Pleurotoma*, 1799) are certainly among the most, if not the most, attractive of all the genera of marine mollusca, and at the same time the most difficult to classify properly. This fact really adds incentive to their study, coupled with their infinite variety of contour, the many rare and abysmal forms, and the certainty of additions occurring to the family whenever new ground—or rather seas—are examined. Yet, so far, no student has made this one group his life-work. I am convinced that the fossil forms (mostly Tertiary) should be studied *pari passu* with the recent, before any satisfactory headway towards the much-needed accurate classification can possibly be reached.

Mr. T. L. Casey<sup>1</sup> has attempted this with some measure of success as regards the larger forms, both recent and fossil, though he has evidently mainly worked out the species of the last named in the United States far more completely than those of the Old World. He creates various new genera for the more pronounced species of considerable size, but notes his inability "after long and patient study of rather large material to devise a system of characters to serve for the definition of the subtribal groups" he includes under the collective term *Daphnellini*.

For the sake of convenience, an alphabetical sequence has been adopted in the enumeration of all the following species under what I assume to be their proper genera, but I have endeavoured, in the remarks that accompany each, to name their most likely affinities.

A large proportion of the forms from this region are endemic, so far as is known, and certain of them are very conspicuous for beauty of contour or coloration. In the first category might be placed such species as *Turris invieta*, *Mungilia Townsendi*, *Clavatula navarchus*, and *Drillia tasconium*; in the second, *Drillia resplendens*, *D. persica* var. *jacintha*, and *Cythara hypercalles*. Many *Daphnellæ* and *Pleurotomellæ*, the ten species of the latter not yet being known elsewhere, are of exquisite and most delicate design, pure white, and abysmal in distribution. It has been found necessary to institute a sub-genus (*Diaugasma*) for the curious *Daphnella epicharta*, M. & St., and another (*Veprecula*) for a series of deep-water *Clathurellæ* with nuclear and other peculiarities. Doubtless, as hinted by Mr. Casey, the vast genus *Mungilia* will be subdivided when the relations of the species are better known; indeed, I believe Mr. Iredale, to whom I am very greatly indebted for many useful hints in nomenclature, already has the matter in hand.

It now only remains for me to thank also Mr. J. R. le Brockton Tomlin for considerable assistance; and Mr. R. Standen, with whom I collaborated in the first enumeration of this Family,<sup>2</sup> as far as the

<sup>1</sup> Trans. Acad. Sci. St. Louis, vol. xiv, 1904, pp. 123-70.

<sup>2</sup> Proc. Zool. Soc. Lond., 1901, pp. 327-460.

Gulf was concerned; Mr. Townsend, as I have often had occasion to observe, in the care exercised in the preservation of the specimens collected, and in the labelling of exact localities, as well as in the selection of good dredging stations, exceeded most, if not all his forerunners, and to him I feel extremely grateful, now, as ever. Lastly, to Miss Gertrude M. Woodward I must express my especial gratitude for the admirable illustrations delineated with such consummate accuracy.

ABBREVIATIONS EMPLOYED TO INDICATE REGIONS OF DISTRIBUTION.

P.G. By these initials is to be understood the whole area of the Persian Gulf, likewise comprehending the Gulf of Oman, with Muscat and Jask, bordered eastward by long.  $59^{\circ} 48' E.$

M.C. The Mekran coast of South Persia and Baluchistan, between long.  $59^{\circ} 48' E.$  and the River Hab.

I. The east coast of continental India from east of the River Hab, abutting on Karachi, say long.  $66^{\circ} 40'$ , south-eastward to Panjim, lat.  $15^{\circ} 50' N.$ , long.  $66^{\circ} 40' E.$

Class **GASTROPODA.**

Order **PROSOBRANCHIATA.**

Sub-order **MONOTOCARDIA.**

§ **TOXOGLOSSA.**

Family **TURRIDÆ (= PLEUROTOMIDÆ).**

I. Sub-family **TURRINÆ.**

Genus **TURRIS**, Bolten, 1798 (= **PLEUROTOMA**, Lamarek, 1799).

1. **TURRIS ACUTA** (Perry).

*Pleurotoma acuta*, Perry, Conchology, 1811, pl. liv, fig. 5.

„ *tigrina*, Lamarek, Anim. sans Vert., vol. vii, 1822, p. 95.

„ „ Deshayes, Anim. sans Vert., 2nd ed., vol. ix, 1843, p. 352.

„ „ Kiener, Coq. Viv., 1839, pl. viii, f. 1.

„ „ Reeve, Conch. Icon., vol. i, 1843, pl. i, f. 3.

„ „ Hedley, Proc. Linn. Soc. New South Wales, 1902, p. 28.

*Lophiotoma* „ Casey, Trans. Acad. Sci. St. Louis, vol. xiv, 1904, p. 130.

P.G. Gulf of Oman, Malcolm Inlet, at 24 fathoms, dead.

M.C. On soft mud, at 7 fathoms, but very scarce.

A widely distributed and not very variable species, extending to the Philippine Isles,<sup>1</sup> where it abounds, and also Fiji and other islands of the Eastern tropical Archipelago. See remarks under *T. indica*.

<sup>1</sup> Hidalgo, Cat. Moll. Test. Ins. Philip., 1904, p. 112.

2. *TURRIS ALBINA* (Lam.).

*Pleurotoma albina*, Lamarek, Anim. sans Vert., vol. vii, 1822, p. 96.

„ „ Reeve, Conch. Icon., vol. i, 1843, pl. ix, f. 77.

P.G. Gulf of Oman. Off Muscat, 30 fathoms.

I. Lat. 18° 43' N., long. 71° 41' E.

Reeve remarks upon the "squareness and equidistant arrangement of the spots which ornament the flattened keel formed by the filling up of the labral slit". The figured specimen was dredged by Surgeon R. Brinsley Hinds, R.N., in the Island of Cerat, Moluccas.

3. *TURRIS INDICA*, Bolt.

*Turris indica*, Bolten, Mus. Boltenianum, 1798, p. 124, No. 1594.

*Pleurotoma marmorata*, Lamarek, Anim. sans Vert., vol. vii, 1822, p. 95.

„ „ Reeve, Conch. Icon., vol. i, 1843, pl. iii, f. 21, *a, b*.

*Lophiotoma marmorata*, Casey, Trans. Acad. Sci. St. Louis, vol. xiv, 1904, p. 130.

P.G. Thairi, Mussandam, east side, 30 fathoms (1912). Malcolm Inlet (Kubbatt Ghazira), giant example, long. 94 mm., dredged at 55 fathoms. From this latter place a shell was procured that may prove a hybrid *indica* × *acuta*.

M.C. Not uncommon, often washed ashore.

## I. Bombay.

A variable species, extreme forms being happily figured by Reeve. Distributed over the Eastern Tropics very widely, ranging from the Red Sea to Australia and Polynesia, and as far north as Japan, I do not agree with Tryon (Man. Conch., vol. vi, 1884, p. 165) that *hastula*, Reeve (Conch. Icon., vol. i, 1843, pl. xvii, f. 139), is the young of this species.

From the Cargados Isles came interesting albino specimens (Stanley Gardiner Expedition).<sup>1</sup> These are probably the *Pl. buelowi*, Sowb., and have the appearance of having been dredged at a considerable depth.

I may add that for this species and *acuta*, Bolt. (as well as *leucotropis*, Ad. & Rve., *jickeli*, Weink., *unedo*, Vil., and *virgo*, Lam.), Dr. Thomas L. Casey proposed a new genus, *Lophiotoma*, laying stress upon the stouter form, abbreviate, with straighter beak, more acutely elevated and less close-set spiral carina, and with deep anal sinus formed centrally *on*, and not *behind*, the peripheral keel, the latter being more strongly elevated and usually sub-duplex.

Possessing all these species, I have closely compared their structure with those few still allowed a place in the typical genus *Turris*, the result being that I prefer to consider them all so closely allied that it seems disadvantageous to separate them even subgenerically. The nepionic whorls are confessedly identical; it is simply a question of the carinæ being more pronounced in such a species as *acuta*, for instance; the same character of marking or painting is to be found, and to a great extent the same build and contour generally.

<sup>1</sup> Trans. Linn. Soc. Lond., ser. II, Zoology, vol. xiii, 1909, p. 118.



4. *TURRIS INVICTA*, Melv.

*Turris invicta*, Melvill, Ann. Mag. Nat. Hist., ser. VIII, vol. vi, 1910, p. 15, pl. ii, f. 27.

P.G. Telegraph cable at 29 fathoms. September 2, 1906. Bushire, Hinderabi Island, Gulf of Oman, 55 fathoms. Several.

One, especially large and fine, measures long.  $90 \times$  lat. 32 mm. Allied to *indica*, it preserves its individuality in all specimens found, especially as regards its remarkably abbreviate contour. So far as is at present known, it is endemic. This would be included in Dr. Casey's genus *Lophiotoma*, to which I referred under *T. indica*.

## § Subgen. GEMMULA, Weinkauff, 1876.

5. *TURRIS (GEMMULA) CONGENER* (Sm.).

*Pleurotoma congener*, E. A. Smith, Ann. Mag. Nat. Hist., ser. VI, vol. xiv, 1894, p. 160, pl. iii, f. 4, 5.

P.G. Gulf of Oman (*Investigator* Expedition), lat.  $23^{\circ} 47' N.$ , long.  $58^{\circ} 30' E.$ , 230 fathoms.

This fine species was originally dredged by the same expedition in the Bay of Bengal, and subsequently west of Travancore at 102 fathoms, also west of the Malabar Coast at 295–360 fathoms, from mud and sand. We had hoped to have found it among Mr. Townsend's collections.

Many other large abysmal species were found by the *Investigator*, but mostly in the Bay of Bengal, or off Ceylon, and the Malabar Coast, outside our limits. Most, if not all of them, have been figured by Messrs. Alcock, Annandale, MacGilchrist, and others in the *Illustrations of the Zoology of the Royal Indian Marine Survey Ship "Investigator"*.

6. *TURRIS (GEMMULA) GEMMATA* (Hinds).

*Pleurotoma gemmata*, Hinds, Proc. Zool. Soc. Lond., 1843, p. 37.

„ „ Reeve, Conch. Icon., vol. i, 1843, pl. x, f. 83.

„ *fusca*, Hombron & Jacquinot, Voy. Sud. Pol. Zool., vol. v, 1850, p. 3, pl. xxv, f. 19–20.

P.G. Gulf of Oman, lat.  $24^{\circ} 5' N.$ , long.  $57^{\circ} 35' E.$ , 205 fathoms, sand, abundant, none full grown. Also lat.  $24^{\circ} 58' N.$ , long.  $54^{\circ} 56' E.$ , 156 fathoms, equally common, and at two contiguous dredgings at 37 and 225 fathoms respectively, in sand and mud. A dark form occurs off Muscat at 20–40 fathoms.

M.C. Off Charbar, 40 fathoms.

*P. fusca*, H. & J., we consider synonymous; the dark form mentioned above might be considered a colour variety for which the name *fusca* would be congenial. Few of our examples are full grown; it is evidently an abysmal species.

The distribution is extended over the eastern tropics from the Red Sea to Australia. It does not, however, occur in Hidalgo's Philippine Catalogue. Hedley, in his Queensland List, separates "*Pleurotoma*" *gemmata*, Hinds, and "*Drillia*" *fusca*, H. & J., and

classes them accordingly in these two genera, but I cannot say I agree with this proposal.

7. *TURRIS (GEMMULA) GILCHRISTI* (Sowb.).

*Pleurotoma gilchristi*, G. B. Sowerby, "Marine Investigations in S. Africa," Cape Town, 1902, p. 99, fig.

M.C. Off Ras Maidani between Jask and Charbar, at 180 fathoms, 1914, occurs what appears to be this species, the type of which came from Natal. It is nearly allied to *P. ceylonica*, Sm., of which I have an example from the Hugh Nevill Collection. The tubercles, however, are smaller and more compact in *gilchristi*, and it is much less in latitude, proportionately, than the var. *quadurensis* of *T. granosa*, Helb. (= *carinata*, Gray).

8. *TURRIS (GEMMULA) GRANOSA* (Helb.).

*Murex (Fusus) granosus*, Helbling, Abhandl. Priv. Böhm. Math. Prag, Bd. iv, 1779, p. 116, pl. ii, f. 16.

Dall, Journ. of Conch., vol. xi, 1906, p. 291.

" " " " " Griffiths' Cuvier Anim. Kingdom, vol. xii, 1834, pl. xxiii.

" " " " " Reeve, Conch. Icon., vol. i, 1843, pl. vii, f. 56.

" " *kieneri*, Doumet, Mag. de Zool., 1840, Moll., pl. x.

P.G. Fahal, 20-40 fathoms; Mussaudam, 30 fathoms, 1912; Gulf of Oman, Muscat, 25-40 fathoms.

Var. *quadurensis*, nov.

Testa ut in typo, sed omnino minor, fere immaculata.

M.C. Gwadûr, one specimen at 70 fathoms. A few others, all much of the same calibre, off Ras Maidani, between Gwadûr and Jask.

The sculpture of this variety is identical with the type; the size about one-half, say 38 mm. as against 60-70 mm., the coloration most simple, nearly immaculate.

9. *TURRIS (GEMMULA) MULTISERIATA* (Sm.). (Pl. VIII, Fig. 3.)

*Pleurotoma multiseriata*, E. A. Smith, Ann. Mag. Nat. Hist., ser. iv, vol. xix, 1877, p. 491.

P.G. Koweit, 10 fathoms.

M.C. In many places, 5-20 fathoms, mud bottom.

I. Twelve miles west of Karachi, on the border of the Mekran coast, at 15 fathoms. Very large examples occurring in this locality, measuring  $\frac{3}{4}$  inch.

Captain Tindall of the S.S. *Patrick Stewart* likewise procured it at Batticaloa, south of our limit.

We follow Paetel<sup>1</sup> in assigning this shell to the section *Gemmula*, but it stands somewhat alone in the assemblage, resembling in extreme miniature such a large deep-water form as *congener*, Sm. It is distinguished by the double row of tubercles, spirally running below

<sup>1</sup> Paetel, Cat. de Conchyl. Samml., 1887, p. 67.

the sutures, and the many close longitudinal liræ or costulæ descending obliquely. The colour varies from reddish brown to full ochreous, the latter colour predominant. There are specimens in the National Collection from Ceylon, the Persian Gulf, and China seas. The original type is now figured.

§ Subgen. TOMOPLEURA, Casey, 1904.

10. TURRIS (TOMOPLEURA) ACUTIGEMMATA (Sm.). (Pl. VIII, Fig. 1.)  
*Pleurotoma acutigemmata*, E. A. Smith, Ann. Mag. Nat. Hist., ser. iv, vol. xix, 1877, p. 489.

P.G. Gulf of Oman, Muscat, 20–40 fathoms.

I. Lat. 18° 58' N., long. 71° 45' E., 40 fathoms.

The locality of the type, now figured for the first time, is unknown. In my opinion, this may stand as distinct from *jubata*, Hinds, to which, however, it is very nearly allied. The author lays stress on the form being narrower, tubercles larger, and canal more abbreviate. It is merged by Tryon (Man. Conch., vi, pp. 171, 172) with Hinds' species, but this evidently only on surmise, since he had never beheld *acutigemmata*. We have it also from the Andaman Islands (Booley).<sup>1</sup>

*Tomopleura*, Casey,<sup>2</sup> was instituted as a genus, while *Gemmula*, Weink., has been also raised to the same rank. I prefer treating both as sub-genera for the present.

11. TURRIS (TOMOPLEURA) CIRCUMVERTENS (Melv. & Stand.).

*Drillia circumvertens*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 436, pl. xxiii, f. 3.

P.G. Gulf of Oman, lat. 24° 49' N., long. 51° 56' E., 225 fathoms, mud; and lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

A small white species, of peculiar sculpture. The two uppermost nuclear whorls are smooth, globular, and shining, the two succeeding, longitudinally nodulously costate, the rest pronouncedly excavate at the sutures, a strong carina or keel just below, on each whorl, and another just above the sutures, the intermediate space smooth with crescent-shaped striation, the lower keel is the strongest, canal only slightly produced, spiral liræ running below the periphery to the base, twelve or thirteen in number. Long. 6, lat. 2.25 mm.

12. TURRIS (TOMOPLEURA) FAGINA (Ad. & Reeve.).

*Pleurotoma fagina*, Adams & Reeve, Voy. Samarang, Moll., pt. 2, 1850, p. 40, pl. ix, f. 2, a–b.

„ „ Tryon, Man. Conch., vol. vi, 1884, p. 167, pl. iii, f. 22.

P.G. Henjam Island, 46 fathoms, sand.

A large species, dark brown, with regular spiral ribs. Only one specimen dredged. The type came from China. It may be considered one of the rarer species.

<sup>1</sup> Casey, Trans. Acad. Sci. St. Louis, vol. xiv, 1904, p. 138.

<sup>2</sup> Proc. Malac. Soc. Lond., vol. ii, 1897, p. 165.

*Pl. annulata*, Reeve, Conch. Icon., vol. i, pl. v, f. 35, of unknown locality, seems near akin.

13. TURRIS (TOMOPLEURA) NIVEA (Phil.).

*Pleurotoma nivea*, R. A. Philippi, Zeitschr. f. Malak., 1851, p. 92.

I. Karachi, 3-7 fathoms, loose stones, and muddy sand.

Originally described from Formosa.

Judging by the Indian examples, this hardly differs from the variety *violacea* (Hinds), excepting in the pure-white coloration, all the *violacea* I have seen being most delicately tinted the palest lilac.

(a) Var. *violacea*, Hinds.

*Pleurotoma violacea*, R. B. Hinds, Moll. Voy. *Sulphur*, 1844, p. 16, pl. v, f. 8.

„ „ Reeve, Conch. Icon., vol. i, 1843, pl. xxii, f. 186.

P.G. Basadu, Kishm Island, and Khor Khairi.

I. Karachi. Inside the harbour in 3-7 fathoms, loose stones and mud.

It is reported to range from the Red Sea to Japan, Philippine Isles, and Australia. The type figured by Reeve came from the north coast of New Guinea and Macassar Straits, 7-22 fathoms. It is therefore in all probability widely distributed over the whole eastern tropics. I am sorry it cannot be taken as the more typical form; but the name had been previously employed, by Mighels and C. B. Adams, so was rendered untenable. *T. nivea* proper is, in my opinion, only the same shell without the pale lilac tint.

(b) Var. *makemonos*, Jous.

*Pleurotoma makemonos*, F. Jousseume, Bull. Soc. Zool. France, 1883, p. 198, pl. x, f. 4.

„ „ Tryon, Man. Conch., vol. vi, 1884, p. 319, pl. xxxiv, f. 10.

P.G. Gulf of Oman, Jask Beach.

Originally described from Aden, this variety merges on the one hand into the type, and on the other approximates *pouloensis*, Jous. This latter, however, is a stouter shell, of a uniform dun colour, but, notwithstanding this, it is probably only another variety of *nivea*.

*Pl. makemonos* is known by its pale-brown hue, with longitudinal patches of a darker shade crossing it at intervals.

It is also reported from Japan.

(c) Var. *pouloensis*, Jous.

*Pleurotoma pouloensis*, F. Jousseume, Bull. Soc. Zool. France, 1883, p. 199.

„ „ Tryon, Man. Conch., vol. vi, p. 319, pl. xxxiv, f. 11.

P.G. Shaikh Shuaib Island.

M.C. Charbar.

I. Karachi.

Usually in 3-5 fathoms, amongst loose stones and muddy sand.

Described originally from Malacca.

Although the two last, here considered varieties, can usually be recognized, I fail, after having examined many examples from the Arabian Sea and Persian Gulf, to be able to draw a hard and fast line between them. *T. pouloensis* is the most incrassate of the series, and the coarsest in build, the typical *violacea* being a graceful, attenuate shell, with slightly more produced canal.

14. TURRIS (TOMOPLEURA) PATRICIA (Melv.).

*Pleurotoma patricia*, Melvill, Proc. Malac. Soc. Lond., vol. vi, 1904, p. 164, pl. x, f. 15.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms, 1903; lat. 25° 6½' N., long. 60° 39' E., 90 fathoms, 1914.

M.C. Astola Island, Charbar, 40 fathoms.

The tumid, longitudinally ribbed, and shining third and fourth whorls of this charming little species characterize it specially. In good condition the shell is tinged with pale violet. I possess examples of *Pl. loprestiana*, Calceara, from Adventure Bank (*Porcupine* Expedition), which show slight affinity, but are quite distinct in form, the effect of the tumid whorls just mentioned being to give *patricia* a somewhat dolioform contour. It appears to be widely distributed over the Gulf area, but is sparse in individuals.

15. ?TURRIS (TOMOPLEURA) THISBE (Melv.).

? *Drillia Thisbe*, Melvill, Proc. Malac. Soc. Lond., vol. vii, 1906, p. 77, pl. viii, f. 20.

P.G. Persian Gulf, Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

A small white shell, with mouth decidedly buccinoid. Nearly all the specimens seen are imperfect as regards the nuclear whorls. The shell is closely, spirally ridged. There are many differences of opinion among those I have consulted as to the proper status of this species, which may be the young of a *Tritonidea* or allied genus. At the same time it seems to possess some *Pleurotomoid* characters, but, until better material is obtained, I fear no quite satisfactory conclusions can be drawn.

Judging by the figure, it resembles in form, shape of aperture, and general sculpture, *Daphnella (Teres) mimica*, Sowb.,<sup>1</sup> from St. Vincent's Gulf, South Australia.

16. TURRIS (TOMOPLEURA) TRYPANODES (Melv.).

*Pleurotoma trypanodes*, Melvill, Proc. Malac. Soc. Lond., vol. vi, 1904, p. 57, pl. v, f. 12.

P.G. Henjam Island, 1906.

Arabian Sea, lat. 18° 58' N., long. 71° 45' E., 40 fathoms.

I. On cable, 100 miles west of Bombay, 1906.

<sup>1</sup> Proc. Malac. Soc. Lond., vol. ii, 1896, p. 27, pl. iii, f. 10.

An elegant tornate species, with produced canal, and spiral ribbing somewhat similar to that of *Pl. nivea*, Phil., but more regular. White, tinted yellowish around the upper double carinæ of each whorl; just below the sutures these carinæ are spirally deeply punctulate, an item omitted in the original description. These additional notes are taken from the specimen noted as from the cable, west of Bombay. The dimensions of this are long. 20, lat. 6 mm. As regards the nuclear whorls, the first two are vitreous, globular, smooth, and shining, the two next, also vitreous, but spirally nodulous.

17. TURRIS (TOMOPLEURA) VERTEBRATA (Sm.). (Pl. VIII, Fig. 4.)

*Pleurotoma vertebrata*, E. A. Smith, Ann. Mag. Nat. Hist., ser. iv, xv, 1875, p. 416.

„ *violacea*, Hinds?, Tryon, Man. Conch., vol. vi, 1884, p. 170, pl. iii, f. 29, 29a.

I. Karachi, Ratnagiri, south of Bombay (Abercrombie).

Also received from Oshima, Japan (Hirase).

This may, perhaps, stand on its own merits, as distinct from *violacea*, Hinds, with which several authors have placed it. It differs in size, also in less prominent spiral ribbing, the characteristics of which, however, are almost identical, and, above all, the chestnut zigzag longitudinal markings down the whorls, the same colour permeating the sutural region in more or less density. My largest example only measures 17 mm. in length, while *nivea* attains 25 mm. or more. I have lately received characteristic Japanese specimens, collected by Hirase. The chestnut painting is distinct and peculiar, in zigzag longitudinal flames on white ground.

Genus ANCISTROSYRINX, Dall, 1881.

18. ANCISTROSYRINX ORIENTIS, Melv.

*Ancistrosyrinx orientis*, Melvill, Proc. Malac. Soc. Lond., vol. vi, 1904, p. 56, pl. v, f. 3.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

In my description of this species I omitted to mention that *A. travancorica*, Smith, a very fine and large abysmal species, of ornate sculpture, had already been recorded from the Eastern tropical area, some way south of our limit. Mr. T. L. Casey,<sup>1</sup> following Cossmann's dictum, considers *Ancistrosyrinx*, Dall, preoccupied by *Cochlespira*, Conrad. Tryon, however, thinks the last = *Pleurotoma*, Lamk. (i.e. *Turris*, Bolt.).

DRILLIA, Gray, 1838.

19. DRILLIA ALCYONEA, Melv. & St.

*Drillia alcyonea*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 435, pl. xxiii, f. 21.

P.G. Gulf of Oman, lat. 24° 55' N., long. 57° 59' E., 37 fathoms, sand and mud.

<sup>1</sup> Trans. Acad. Sci. St. Louis, vol. xiv, 1904, p. 144.



This species has not been found since by Mr. Townsend. It is a small (long. 12 mm.) shining white shell, superficially fasciolaroid.

20. DRILLIA ANGRIASSENSIS, Melv.

*Drillia angriasensis*, Melvill, Mem. Manch. L. & P. Soc., vol. xlii, No. 4, 1898, p. 11, pl. i, f. 3.

I. Angrias Bank, west of Bombay (Captain Tindall).

A white, smooth shell, with nodulous angled whorls, and almost plain last whorl, lip effuse, base sub-truncate. The type, in the British Museum, Natural History, is still unique.

21. DRILLIA ATHYRMA, Melv. & St.

*Drillia athyrma*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 436, pl. xxiii, f. 22.

P.G. Gulf of Oman, lat. 24° 58' N., long. 57° 59' E., 37 fathoms, sand and mud.

Also at 142 fathoms, off Ras Maidani.

The examples subsequently secured are more mature than was the original type. The outer lip in the Ras Maidani examples is lobed, somewhat after the manner of *Pleurotoma lobata*, Sowerby.<sup>1</sup> The largest example, unfortunately with imperfect outer lip, measures longitudinally 26 mm., is whitish, the spiral raised ridge just below the suture of each whorl is pronounced, with ribs thick, straight, and somewhat oblique on the last whorl only. In a smaller, and more perfect specimen, the labral lobe projects almost at right angles to the slightly produced canal. The aperture is milky-white within, whorls in young specimens very closely spirally striate, slight chestnut maculations very sparsely cover the surface in certain examples, in others the coloration is simple, dead white or palest ochreous.

22. DRILLIA AUDAX, Melv. & St.

*Drillia audax*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. vii, vol. xii, 1903, p. 313, pl. xxiii, f. 1.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

A distinct species, both in sculpture and painting. It has not been noticed elsewhere in the Persian Gulf region save in the particularly productive dredging mentioned above. It, however, is of fairly wide distribution, evidenced by its occurrence in the Savu Sea, East Indies (*Siboga* Expedition).<sup>2</sup>

23. DRILLIA BAYNHAMI (Sm.). (Pl. VIII, Fig. 9.)

*Pleurotoma (Drillia) baynhami*, E. A. Smith, Proc. Zool. Soc., 1891, p. 404, pl. xxxiii, f. 2.

P.G. Gulf of Oman, Muscat, 15 fathoms.

I. Karachi.

This seems very nearly allied, if not identical, with *Drillia suturalis*,

<sup>1</sup> Marine Investig. South Africa, vol. ii, 1903, p. 213, pl. iv, f. 9.

<sup>2</sup> M. M. Schepman, Prosobr. *Siboga* Exped., 1913, p. 414.

Gray.<sup>1</sup> The type, of which we give a figure, is a pale shell, of refined sculpture, tinted with pale brown. Most of the numerous specimens we have placed under this name seem best included under *intertincta*, Sm., a species with more prolonged canal, and decided marking and coloration, especially interstitially. The type came from Aden.

#### 24. DRILLIA CECCHI, JOUSS.

*Drillia cecchi*, Jousseume, Le Naturaliste, 1891, p. 232.

P.G. Henjam Island (1906), Gulf of Oman, Jask.

M.C. Local at 3–30 fathoms, muddy sand.

A pure-white species, which seems constant in its somewhat critical characters. The type came from Aden, and it has since been again collected there by Commander E. R. Shopland.<sup>2</sup> Near to *D. theoreta*, Melv., which is a highly coloured species, with more abbreviate canal.

#### 25. DRILLIA CHIMAISTRUM, sp. nov. (Pl. X, Fig. 11.)

*D. testa compacta, fusiformi, solidula, nivea, unicolorata, anfractibus in specimine maximo ad 11, tribus supernis planiusculis, lacteo-vitreis, cæteris ventricosulis, ad suturas impressis, longitudinaliter costatis, costis incrassatis, anfractus ultimi numero tredecim, undique spiraliter regulariter liris, apertura breviter ovata, intus alba, sinu lato, canali paulum producto, margine columellari fere recto.*

(*χειμαστρον*, winter apparel, from the snowy-white colour.)

Long. 16, lat. 6 sp. max.

P.G. Mussandam, 30 fathoms. Malcolm Inlet, 35 fathoms. Gulf of Oman, Diamanayat Isles, 20 fathoms (15 April, 1912).

A pure-white, somewhat compressed and compact species, the whorls ventricose, compressed suturally, longitudinally ribbed, ribs straight, incrassate, crossed throughout by spiral filose liræ, mouth subovate, sinus distinct, broadened, columellar margin almost straight. It seems near to *putillus*, Reeve, and perhaps *spectrum* of the same author, but is a far more solid species than the last-named.

#### 26. DRILLIA CLYDONIA, Melv. & St.

*Drillia clydonia*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 437, pl. xxiii, f. 24.

P.G. Henjam Island, 1906. Muscat, 20–35 fathoms, 1914. Gulf of Oman, lat. 24° 49' N., long. 57° 56' E., 225 fathoms, mud.

A pretty species, not variable, with obliquely flexuose longitudinal ribs, surface either whitish, stramineous, or slightly rufous, shining, canal slightly produced; most nearly allied to *D. omanensis*, M. & St.

#### 27. DRILLIA CRENULARIS (Lam.).

*Pleurotoma crenularis*, Lamareck, Anim. sans Vert., vol. vii, 1822, p. 92.

„ „ Reeve, Conch. Icon., vol. i, 1843, pl. vii, f. 54.

For localities see under variety A.

<sup>1</sup> Ann. Nat. Hist. (Charlesworth), vol. i, 1838, p. 29.

<sup>2</sup> Proc. Malac. Soc. Lond., vol. v, 1902, p. 172.

(a) Var. *atkinsonii*, Sm. (Pl. VIII, Fig. 7.)

*Pleurotoma (Drillia) atkinsonii*, E. A. Smith, Ann. Mag. Nat. Hist., ser. iv, vol. xix, 1877, p. 495.

P.G. Muscat, 25 fathoms.

M.C. Rarely, at 10–12 fathoms.

I. Bombay, where it appears the prevailing form, though the type has also been recorded (Abercrombie). Lieut.-Col. H. D. Olivier has also collected the typical *crenularis* at Bassein, near Bombay. Karachi (Townsend), both the type and the variety.

(b) Var. *griffithii*, Gray.

*Pleurotoma griffithii*, J. E. Gray MSS., Reeve, Conch. Icon., vol. i, 1843, pl. vii, f. 57.

P.G. Gulf of Oman, Jask, on hard sand. Muscat, 10–35 fathoms.

M.C. Charbar, at low spring tides.

I. Karachi, specimens washed up all along the coast.

I expect when all the forms allied to *crenularis* (and by this is meant *baynhami*, Sm., *intertincta*, Sm., *major*, Gray, etc., mostly separable by coloration, or some other peculiarity liable to vary) are studied really closely, that they will be found hardly worthy of separate specific rank.

## 28. DRILLIA DIVES, Melv. &amp; St.

*Drillia dives*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. vii, vol. xii, 1903, p. 311, pl. xxii, f. 13.

P.G. Gulf of Oman, Muscat, 25 fathoms.

In the original description this is represented as being allied to *D. clydonia*. I now think *D. philotima* its nearest ally. The latter, however, has far more frequent longitudinal costæ, and the mouth is narrower.

## 29. DRILLIA EUCYROËS, Melv.

*Drillia eucyroës*, Melvill, Proc. Malac. Soc. Lond., vol. x, 1912, p. 250, pl. xi, f. 11.

P.G. On the Telegraph Cable, September 2, 1906.

A most distinct species, latiroid superficially, the sinus being very obscure, and the painting of spiral ochreous lines alternating with white and darker stramineous, somewhat resembling *Latirus turritus*, Gmel., or a miniature *Fasciolaria filamentosa*, Mart. It has occurred but very rarely.

## 30. DRILLIA FLAVIDULA (Lam.).

*Pleurotoma flavidula*, Lamarek, Anim. sans Vert., vol. vii, 1822, p. 92.

„ „ „ „ Reeve, Conch. Icon., vol. i, 1843, pl. viii, f. 66.

P.G. Koweit, 7 fathoms. Shaikh Shuaib Island, 36 fathoms (1906). Gulf of Oman, Jask, 175 fathoms (1912). Malcolm Inlet (Kubbatt Ghazira), very uncommon at 24 fathoms.

A species of bold contour, particularly abundant in Erythræan waters. The Jask specimens are fine and large, often covered with *Malluvium lissum* (Sm.), one of the Calyptræidæ, peculiar to these

seas and a deep-water form. The distribution of *D. flavidula* is wide, including Hong-Kong and China proper. But the largest example in my collection is from the northern shore of the Red Sea, that was picked up on a sandy beach many years ago by my cousin, the late Miss Mary Alexina Haldane, and kindly presented to me. This is about 2½ inches in length (say 68 mm.), pale straw coloured throughout, and in perfect condition.

With this species I am inclined also to place *Pl. (Drillia) latisinuata*<sup>1</sup> of Smith. I possess a co-type of this "ex auctore", and at the suggestion of Mr. Le Broekton Tomlin, have well compared it with a large and variable series of *flavidula* in my collection. Mr. Smith admits the near alliance of the two species, and lays stress on "the upper half of each whorl being nearly smooth, as the plications extend scarcely beyond the central large spiral liration which marks the angulations of the whorls". This may be true as regards the type, but there are several intermediates, and I think we may consider *flavidula* as a protean species, and what may be called the form *latisinuata* does likewise occur in the Persian Gulf.

### 31. DRILLIA GRANATELLA, M. & St.

*Drillia granatella*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. VII, vol. xii, 1903, p. 312, pl. xxii, f. 18.

P.G. Gulf of Oman, Muscat, 15 fathoms.

A very pretty little form, pomegranate pink in colour, whence the specific name. Allied to *persica*, Sm., but characteristic and peculiar.

### 32. DRILLIA INCERTA (Sm.). (Pl. VIII, Fig. 5.)

*Pleurotoma (Drillia) incerta*, E. A. Smith, Ann. Mag. Nat. Hist., ser. IV, vol. xix, 1877, p. 496.

P.G. Henjam Island, 10–14 fathoms (1906). Gulf of Oman, lat. 24° 55' N., long. 57° 59' E., 205 fathoms, sand. Also in contiguous sounding, at 37 fathoms, sand and mud.

A species of somewhat uncertain status, and therefore well named. The prolonged canal serves slightly to distinguish it, and its pale, colourless whorls; the sinus, too, is remarkably patent, but it is not easy to characterize its qualities for purpose of differentiation. We would refer to the author's description. The type now figured came from New Guinea. But few examples have been yet found in the Persian Gulf area. *D. jousseauimei*, Melv., from Aden (Shopland), is to be compared with it. This last has not occurred, so far, elsewhere.

### 33. DRILLIA INCONSTANS (Sm.). (Pl. X, Fig. 1.)

*Pleurotoma (—?) inconstans*, E. A. Smith, Ann. Mag. Nat. Hist., ser. IV, vol. xv, 1875, p. 417.

P.G. Henjam Island, 14 fathoms. Shaikh Shuaib Island, Pasui, 40 fathoms. Gulf of Oman, lat. 24° 55' N., long. 57° 09' E., 37 fathoms, sand and mud.

<sup>1</sup> Ann. Mag. Nat. Hist., ser. IV, vol. xix, 1877, p. 494.

I. Karachi. Angrias Bank and Malabar Coast (Captain Tindall), 5 fathoms.

This is a plentiful species, and appears to be more "inconstant" in colour than form. The hue varies from pale straw colour and almost white to chocolate-brown. Sometimes the tubercles, spirally arranged below the sutures, are shining white, the rest of the shell being darker, but this is a rare variety. So nearly akin is this species to certain forms of *pyramidula*, Reeve, that I expect they will be united some day, if not immediately.

34. DRILLIA INTERTINCTA (Sm.). (Pl. VIII, Fig. 6.)

*Pleurotoma (Drillia) intertincta*, E. A. Smith, Ann. Mag. Nat. Hist., ser. iv, vol. xix, 1877, p. 497.

P.G. Henjam Island, Muscat, 5-15 fathoms, sand or muddy bottom. Largest examples measure  $1\frac{1}{2}$  inches in length.

M.C. Extends along the Mekrau coast past Charbar, almost to Gwadûr.

A handsome species, at one time rather confounded with *baynhami*, Sm. It is still very abundant where found, and we have seen many specimens without much variety. The dark-brown blotches at the interstices are very conspicuous: the trivial name was imposed in recognition of this. The canal is somewhat produced, form more attenuate proportionately than most of its congeners. It is mentioned by Hidalgo as occurring at the Island of Cebu, Philippines.

35. DRILLIA LITHORIA, Melv. & St.

*Drillia lithoria*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. vii, vol. xii, 1903, p. 313, pl. xxii, f. 20.

P.G. Bahrein Islands, 6 fathoms, coral sand.

A small nodulous species, of the same character as *inconstans*, Sm., *prunulum*, Melv., *radula*, Hinds, but with the spiral nodules much fewer and larger in proportion. It is of very rare occurrence.

36. DRILLIA LUCIDA, G. & H. Nev. (Pl. IX, Fig. 7.)

*Drillia lucida*, G. & H. Nevill, Journ. As. Soc. Beng., vol. xlv, pt. ii, 1875, p. 84, pl. viii, f. 15.

*Pleurotoma (Drillia) disjecta*, E. A. Smith, Ann. Mag. Nat. Hist., ser. vi, vol. ii, 1888, p. 308.

P.G. Henjam Island, 10 fathoms. Gulf of Oman, Muscat, 10 fathoms, muddy sand.

The type of *lucida* is in the Indian Museum, Calcutta, and we, therefore, have not had an opportunity for comparing it with *disjecta*, but judging from the good figure, which is drawn on a considerably magnified scale, there can be little doubt that these are one and the selfsame species. We have figured the actual type of *disjecta* from the National Collection. Mr. Smith lays stress upon the upper ribs in this species being always nodulous, and thus being capable of being distinguished from the very nearly allied *persica* at sight. To my mind, nevertheless, these species are almost too near, and mainly

out of regard to the memory of the author I still keep them distinct for the present.

37. DRILLIA MINDANENSIS, Sm.

*Drillia mindanensis*, E. A. Smith, Ann. Mag. Nat. Hist., ser. iv, vol. xix, 1877, p. 493.

P.G. Investigator Expedition.

One specimen dredged, according to the author<sup>1</sup> of the species, in all respects similar to the type from the Philippine Isles excepting that the spire is a little shorter. I have neither seen this nor can I find its exponent in the Museum.

38. DRILLIA NITENS (Hinds).

*Clavatula nitens*, R. B. Hinds, Moll. Voy. Sulphur, 1844, p. 20, pl. vi, f. 17.

*Pleurotoma* ,, Reeve, Conch. Icon., vol. i, 1845, pl. xxii, f. 189.

*Mangilia* ,, Tryon, Man. Conch., vol. vi, 1884, p. 253, pl. xx, f. 2.

P.G. Dabai. Diamanayat Island, 20 fathoms.

I. Lat. 18° 58' N., long. 71° 45' E., 40 fathoms.

Our specimens are only half the size, longitudinally, of the fine shell figured by Reeve from New Guinea. The discoverer, R. B. Hinds, also found it plentiful in Celebes and at Malacca, from 7 to 22 fathoms. Our examples vary in body-colour from shining white to umber-brown. All are very shining, and, as Reeve remarks, it is "a characteristic and well-defined species". It appears in Hedley's Queensland list, and likewise in that of Hidalgo, from the Philippine Isles.

39. DRILLIA OBLIQUATA (Reeve).

*Pleurotoma obliquata*, Reeve, Proc. Zool. Soc. Lond., 1845, p. 115.

,, ,, Reeve, Conch. Icon., vol. i, 1845, pl. xxix, f. 262.

*Drillia* ,, Tryon, Man. Conch., vol. vi, 1884, p. 203, pl. xi, f. 1.

P.G. Henjam Island, at 10 fathoms (1906).

M.C. Charbar, 10 fathoms. Local, but widely spread over the Mekran coast.

I. Karachi, at 5 fathoms. Amongst loose stones, etc.

The range of this species, distinguished by its heavy growth and few oblique ribs, extends from the Persian Gulf to Ceylon, Singapore, Malayana, and as far as Japan. It is a well-marked shell. This, and perhaps *nitens* also, might with propriety be transferred to *Tylotia*.

40. DRILLIA OMANENSIS, Melv. & St.

*Drillia omanensis*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 438, pl. xxiv, f. 1.

P.G. Gulf of Oman, lat. 24° 55' N., long. 57° 59' E., 37 fathoms, sand and mud. Also at 110 fathoms.

M.C. Jask, 170 fathoms (1909).

<sup>1</sup> Ann. Mag. Nat. Hist., ser. VII, vol. xviii, 1906, p. 164.



The delicate spiral liræ, very close and fine, distinguish this species from its nearest allies. The canal is slightly produced, ribs stouter and straighter than in the allied *D. clydonia*, Melv. & St. It is not an uncommon species, though endemic.

41. DRILLIA PERSICA (Sm.). (Pl. IX, Fig. 6.)

*Pleurotoma (Drillia) persica*, E. A. Smith, Ann. Mag. Nat. Hist., ser. vi, vol. ii, 1888, p. 307.

” ” ” Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 439, pl. xxi, f. 14 (type).

P.G. Henjam Island. Fao. Bushire, at about 10–12 fathoms, Gulf of Oman, Muscat, 20 fathoms, not uncommon. Off Diamanayat Island, 100 miles south of Jask, at 20 fathoms.

I. Karachi, 5–15 fathoms, in thick clayey mud. Also reported from New Caledonia by Bouge & Dautzenberg.

See the remarks (*ante*, p. 154) under *lucida*, G. & H. Nevill. Mr. Edgar Smith gives 9 mm. as maximum length of this species, as against 7.5 mm. in *disjecta*, its very near ally, and which we have sunk as an absolute synonym of *lucida*, Nev. A dwarf form, however, exists, 6 mm. only in length, from the Gulf of Oman (lat. 25° 6' 5" N., long. 60° 39' E.). The specimens are bright brownish-pink, very shining. It may not perhaps have attained quite full growth, although the outer lip is fairly formed. It is quite distinct from *granatella*, Melv. A much larger and very beautiful variety seems worthy of a varietal name as follows:—

Var. *jacintha*, nov. (Pl. IX, Fig. 8.)

Shell brilliantly shining, fusiform, somewhat attenuate, white, the interstices deeply shaded with brown-pink, much larger than the typical form—say, long. 14, lat. 4.50 mm.

From the Persian Gulf.

If it were not for intermediates, this might be considered a fitting claimant for true specific rank.

42. DRILLIA PHILOTIMA, Melv. & St.

*Drillia philotima*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. vii, vol. xii, 1903, p. 311, pl. xxii, f. 16.

P.G. Off the Bahrein Islands, 30–50 fathoms. Muscat, 7–30 fathoms.

A most graceful species, elegantly fusiform, scabrous, many-ribbed, white, tinted with madder brown or chestnut, its nearest ally being *D. dives*, Melv. & St., from the same seas. It has but rarely occurred, and, so far as is known, is endemic in this region.

43. DRILLIA PRUNULUM, Melv. & St.

*Drillia prunulum*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 439, pl. xxiv, f. 2.

P.G. Henjam Island, Koweit, 10 fathoms. Gulf of Oman, Muscat, 15 fathoms.

I. Karachi (September, 1910).

A plum-coloured shell, larger in all its parts than *inconstans*, Sm., being of the same alliance. The largest specimen I have seen measures long. 18 mm. as against 8.50 mm. in *inconstans*. Indeed, the type of the latter only measures 5 mm.

The nearest ally seems *D. radula*, Hinds (Moll. Voy. *Sulphur*, 1844, p. 16, pl. v, f. 9), from the Straits of Malacca and Australia (Queensland), well figured by Reeve (Conch. Icon., pl. xxv, f. 223). The nodules in *radula* are shining white, contrasting with the dark-brown body-colour. I have examples from the Lombe Taylor Collection. It is larger (long. 20 mm.) and coarser in its sculpture than *prunulum*, the largest specimen of which that we have seen comes from Koweit, and measures long. 15 mm. The noduled riblets are here almost twice the number of those obtaining in *radula*. Notwithstanding this, doubtless *inconstans*, *lithoria*, *prunulum*, *pyramidula*, and *radula* have many characters in common, and probably spring from a common ancestor.

44. DRILLIA PYRAMIDULA (Reeve). (Pl. X, Fig. 2.)

*Pleurotoma pyramidula*, Reeve, Proc. Zool. Soc. Lond., 1845, p. 115.

„ „ „ „ Reeve, Conch. Icon., vol. i, 1845, pl. xxix, f. 260.

*Clathurella* „ „ Melv. & St., Proc. Zool. Soc. Lond., 1901, p. 445.

P.G. Koweit, 10 fathoms. Henjam Island, Muscat, 10 fathoms. Kuh i Mubarik, 45 fathoms.

M.C. Charbar, 40 fathoms.

So allied to *inconstans*, Smith, that I have caused the two to be figured in approximation to each other, to show the chief distinctions, which are: (a) in form, the present species tapering gradually to the apex, whilst *inconstans* is of more abbreviate build. Again (b), the spiral nodules so conspicuous a feature in Smith's species are hardly present in its ally, *pyramidula* being, to quote the words in the original description, "pyramidally elongated, very closely latticed with minute longitudinal and transverse ridges." The second and third nuclear whorls are carinate.

45. DRILLIA RESPLENDENS, Melv.

*Drillia resplendens*, Melvill, Mem. Manch. Soc., vol. xlii, 1898, No. 4, p. 11, pl. ii, f. 8.

„ „ „ „ Melv. & St., Proc. Zool. Soc. Lond., 1901, p. 439, pl. xxi, f. 11.

P.G. Muscat, 7-10 fathoms. Gulf of Oman, lat. 24° 55' N., long. 57° 59' E., 37 fathoms, sand and mud, only in young condition.

On the telegraph cable in three or four places amongst shell and other growths it attains a fair size (20-2 mm.), and is remarkably polished and fine in deep red-brown colour. An albino variety occurred off Muscat. A very bright and beautiful species, one of the most admired of the genus, and belonging to the same section of the genus as *lucida*, Nevill, and *persica*, Sm., the variety *jacintha* of which, just described above, almost exceeds *resplendens*, if possible, in select elegance.

## 46. DRILLIA ROBUSTA (Hinds).

*Clavatula robusta*, Hinds, Moll. Voy. *Sulphur*, 1844, p. 17, pl. v, f. 12.  
*Pleurotoma* ,, Reeve, Conch. Icon., vol. i, 1845, pl. xxiii, f. 204.

P.G. Bahrein Isles.

We enter this with a degree of doubt. Only one specimen occurred, which probably belongs to this species, but its condition is not good. The type came from Hong-Kong Island (Hinds). Hidalgo mentions it as an Australian shell, probably not occurring in the Philippines.

## 47. DRILLIA SINENSIS (Hinds).

*Clavatula sinensis*, Hinds, Proc. Zool. Soc. Lond., 1843, p. 38.  
*Pleurotoma* ,, Reeve, Conch. Icon., vol. i, 1843, pl. xviii, f. 153.

P.G. Mussandam, 45 fathoms (1915), a white variety. Muscat, 20-40 fathoms (1912), finely coloured live varieties.

M.C. Rare, an attenuate variety, occurs occasionally at 10-15 fathoms, near Gwadûr.

I. Karachi. Young examples only, dredged living.

A very well-marked species, well figured by Reeve. Originally described from the China Sea and Straits of Macassar, found at depth of from 5-25 fathoms.

I may add that Tryon<sup>1</sup> is in complete error in attempting to merge *Pl. intertincta*, Smith, with this species. There could hardly be two *Drillia* more dissimilar.

Hidalgo includes it in his Philippine Catalogue, and Hedley notes it from Queensland.

## 48. DRILLIA SPECTRUM (Reeve).

*Pleurotoma spectrum*, Reeve, Proc. Zool. Soc. Lond., 1845, p. 113.  
 ,, ,, Reeve, Conch. Icon., vol. i, 1845, pl. xxv, f. 222.

P.G. Malcolm Inlet (Kubbatt Ghazira), 35 fathoms.

Gulf of Oman, lat. 26° 10' N., long. 52° 50' E., 29 fathoms, none living, mud and rocky basis.

These specimens are placed under *spectrum* with just a little doubt. They agree up to a certain point, and it was thought best to allow for a certain percentage of variability. The original examples, collected by Mr. Hugh Cuming at Puerto Galero, I. Mindoro, Philippines, are described as of thin texture; also as "a pale obliquely plaited shell minutely and delicately ridged across".

## 49. DRILLIA TASCONIUM, Melv. &amp; St.

*Drillia tasconium*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 440, pl. xxiv, f. 3.

P.G. Gulf of Oman, lat. 24° 55' N., long. 57° 59' E., 37 fathoms, sand and mud. Also a variety at Kuh i Mubarik (1894).

Near Jask, at 175 fathoms, fine, live examples (1912).

A curious species, isolated in appearance and character. At the time of description we compared it with the figure of *D. lucida*,

<sup>1</sup> Man. Conch., vi, p. 201.

G. & H. Nevill, misled by the highly magnified scale of the illustration. Our species is four times the size, say long. 28 mm.

*D. pallida*, Sowb., of which I possess a beautiful example from Central American shores, is also comparable, but it is not only smaller, whilst the costæ of the body-whorl are oblique, and the form more attenuate. *D. tasconium* is very liable to sea-breaks and slight distorsion, consequently it is not very easy to secure a really good-conditioned specimen.

#### 50. DRILLIA TAYLORIANA (Reeve).

*Pleurotoma tayloriana*, Reeve, Conch. Icon., i, 1846, pl. xl, f. 366, a, b.

P.G. Gulf of Oman, Muscat, 15-40 fathoms. Also in the Persian Gulf proper, Shaikh Shuaib Island, 10 fathoms, fine examples.

Our specimens are precisely similar in every way to the type so excellently portrayed by Reeve. *D. variabilis*, Sm., *theoreta*, Melv., and *topaza*, Melv. & St., are the nearest allies. Hidalgo notes it as found by Quadras in the Island of Cebu, Philippines. Hedley, too, notes it from Queensland.

#### 51. DRILLIA THEORETA, Melv.

*Drillia theoreta*, Melvill, Ann. Mag. Nat. Hist., ser. VII, vol. iv, 1899, p. 85, pl. i, f. 2.

P.G. Henjam Island, 20-25 fathoms, and a small brightly coloured variety at 10 fathoms. Shaikh Shuaib Island, Kishm, and other islands in the Gulf, seemingly generally distributed.

Smaller in all its parts, and with the whorls far less ventricose than obtains in *D. tayloriana*, Reeve; also some affinity with *D. cecchi*, Jous., is observable, but this species is always much paler and with little trace of pattern, the spire is likewise more attenuate, and it has more the character of an abyssal species.

#### 52. DRILLIA TOPAZA, M. & St.

*Drillia topaza*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 440, pl. xxiv, f. 4.

P.G. Gulf of Oman, Muscat, 15-20 fathoms.

An ally of *D. theoreta*, Melv., but much smaller, and with mamillate protoconch. The longitudinal ribs are very few, only six round the body-whorl. The coloration is also peculiar, reddish-pink and dark purplish-red beyond the sinus and round the mouth. It is a rare species, and decidedly local in its distribution.

#### 53. DRILLIA VARIABILIS, Sm. (Pl. VIII, Fig. 8.)

*Drillia variabilis*, E. A. Smith, Ann. Mag. Nat. Hist., ser. IV, vol. XIX, 1877, p. 495.

*D. variabilis*, Proc. Zool. Soc. Lond., 1878, p. 805, pl. I, f. 2, 3.

P.G. Off Dabai, among the pearl oyster beds at 6 to 8 fathoms. Gulf of Oman, lat. 23° 50' N., long. 27° 50' E., soft mud. And also lat. 26° 6' N., long. 51° 52' E., 15 fathoms, coral sand.

I. Telegraph cable at 47 fathoms 100 miles west of Bombay. Small examples near the mouth of the River Indus, Karachi.

This species has likewise been received from Andaman Isles (Booley),<sup>1</sup> whence indeed the original type came. It is also reported from Erythræan waters. We have figured the type, representing a much broader shell than is the case with its congeners, *tayloriana*, Rve., and *theoreta*, Melv. The examples I received from the late Mr. G. Booley, just mentioned, are pale in colour, freckled with pale brown, and echinately noded.

§ Subgen. TYLOTIA, nom. nov. (= CLAVUS, auctt. non Montfort, 1810).

Mr. Iredale assures me it is antagonistic to the laws of priority to continue using the name "*Clavus*" subgenerically, it having been published by Montfort twenty-eight years earlier for a different group than the accepted generic "*Drillia*", Gray, 1838. Accordingly, a new cognomen being necessary, I venture to propose *Tylotia*, which, being derived from τύλος, a nail or club, has the same meaning as *Clavus*. The type appears to be *cunicularis*, Bolt. = *auriculifera*, Lam.

54. DRILLIA (TYLOTIA) CANICULARIS (Bolt.).

*Strombus lividus*, Chemnitz, Conch. Cab., ix, 1786, pl. 136, f. 1269-70.

" " Gmelin, Linn. Syst. Nat., 13th ed., tom. i, pt. vi, 1791, p. 3523.

" *cunicularis*, Bolten, Mus. Boltenianum, 1798, p. 100, No. 1291.

*Pleurotoma auriculifera*, Lamarek, Anim. sans Vert., vol. vii, 1822, p. 91.

" " Reeve, Conch. Icon., vol. i, 1843, pl. viii, f. 69.

I. Bombay (Abercrombie).

Originally described from the Philippines, the present record shows considerable extension of range westward. It has not occurred yet further north.

Mr. C. Hedley<sup>2</sup> uses Gmelin's name; but Iredale<sup>3</sup> does not agree with this, and writes exhaustive reasons in favour of Bolten's name being employed. I am very grateful to Mr. Iredale for the advice he has given me on this subject. This species I consider the type of the section.

55. DRILLIA (TYLOTIA) CRASSA (Sm.). (Pl. VIII, Fig. 10.)

*Pleurotoma (Drillia) crassa*, E. A. Smith, Ann. Mag. Nat. Hist., ser. vi, vol. ii, 1888, p. 301.

P.G. Muscat. Gulf of Oman, Jask.

I. Bombay (Abercrombie).

This species might, perhaps, be occasionally confused with *sacra*, Reeve; the author, in comparing the two, mentions the violet apex of *crassa*, and its "fewer ribs which are angled, and the upper ends

<sup>1</sup> Proc. Malac. Soc. Lond., vol. ii, 1897, p. 166.

<sup>2</sup> Proc. Linn. Soc. N.S.W., vol. xxxiv, 1909, p. 453.

<sup>3</sup> Proc. Malac. Soc. Lond., vol. xii, 1916, p. 92.

of them not nodose at the suture, the coloration also being different in the two forms". It is a species of fair size, between 20 and 25 mm. longitudinally.

56. DRILLIA (TYLOTIA) FUCATA (Reeve).

*Pleurotoma fucata*, Reeve, Proc. Zool. Soc. Lond., 1845, p. 110.

" " " Conch. Icon., vol. i, 1845, pl. xx, f. 169.

" " " Tryon, Man. Conch., vol. vi, 1884, p. 189,  
pl. xi, f. 86, 93.

" " " Bouge & Dautzenberg, Journ. de Conch.,  
tom. lxi, 1914, p. 138.

I. Karachi, 5 fathoms, loose stones and mud.

I am not quite satisfied about the identification of this species, which occurred in Mr. Townsend's earliest gatherings at Karachi, but has not been met with since. It may be a form of *unizonalis*, Lam. Reeve did not know the locality of this species, but Tryon gives "West Indies", and it is also reported from New Caledonia by Bouge & Dautzenberg, who also give St. Jan, Antilles (Kobelt), South Africa (v. Martens), Oshima, Japan (Hirase), as stations for its occurrence.

57. DRILLIA (TYLOTIA) PRÆCLARA (Melv.).

*Pleurotoma (Clavus) præclara*, Melvill, Mem. & Proc. Manch. Soc., ser. iv, vol. vii, 1893, p. 1, pl. i, f. 2.

I. Bombay, up the coast (Abercrombie).

This large and conspicuous species is rare in its only known locality, and has not yet been found excepting in rather worn condition. It is 44 to 45 mm. in length by 16 in breadth. It seems undoubtedly a member of the sub-genus *Tylotia*.

58. DRILLIA (TYLOTIA) SACRA (Reeve).

*Pleurotoma sacra*, Reeve, Proc. Zool. Soc. Lond., 1845, p. 111.

" " " Conch. Icon., vol. i, 1845, pl. xxi, f. 183.

P.G. Shaikh Shuaib Island. Gulf of Oman, Muscat.

I. Karachi, local at 3-7 fathoms. Bombay (Abercrombie).

Some of our examples exceed the specimen figured by Reeve, and others possess a darkish slate-coloured fascia around the centre of the body-whorl, but otherwise the species does not vary much. Till recently the locality was unknown. A fine example I possess, which was received from the late Dr. J. C. Cox, is 1½ inches in length.

59. DRILLIA (TYLOTIA) UNIZONALIS (Lam.).

*Pleurotoma unizonalis*, Lamarek, Anim. sans Vert., vol. vii, 1822, p. 92.

" " " Reeve, Conch. Icon., vol. i, 1843, pl. xiii, f. 113.

*Drillia (Clavus) unizonalis*, Tryon, Man. Conch., vol. vi, 1884, p. 185,  
pl. ix, f. 38.

P.G. Malcolm Inlet (Kubbatt Ghazira).

There is an element of doubt about the two or three examples recorded from the above locality. They were not very characteristic. The range of this species is wide throughout the tropics, embracing New Caledonia, Fiji, the Philippines, Solomon Isles, etc. By



Bouge & Dautzenberg<sup>1</sup> it is considered merely an unarmed variety of *Drillia (Tylotia) canicularis* (Bolt.).

II. Sub-family CLAVATULINÆ.

Genus ORTHOSURCULA, Casey, 1904.

60. ORTHOSURCULA AUSTRALIS (Roissy).

*Murex turris australis*, Chemnitz, Conch. Cab., vol. xi, 1795, pl. cx, f. 1827-8.

*Pleurotoma australis*, Roissy, Hist. nat. Moll. [suite à Buffon], vol. vi, 1805, p. 72.

    "    "    Kiener, Icon. Coq. viv., 1839, p. 6, pl. iv, f. 1.  
*Surcula*    "    Tryon, Man. Conch., vol. vi, 1884, p. 236, pl. ii, f. 9, and pl. v, f. 58.

*Orthosurcula*    "    T. L. Casey, Trans. Acad. Sci. St. Louis, vol. xiv, 1904, p. 151.

I. South of Bombay (Lieut.-Col. Henry D. Olivier).

The headquarters of this species are China and the Philippine Isles; it has not yet been found in the Persian Gulf area proper. Casey, in subdividing the group, considers the types of his *Orthosurcula* to be the Upper Eocene species, *Pleurotoma longiforma*, Aldrich, and *Surcula transversaria*, Lamarck.

Genus SURCULA, H. & A. Adams, 1853.

61. SURCULA CATENA (Reeve).

*Pleurotoma catena*, Reeve, Conch. Icon., i, 1843, pl. v, f. 36.

P.G. Gulf of Oman, Muscat, 20-40 fathoms. April, 1912.

M.C. Charbar. In young condition 5-10 fathoms, fine adult examples 20-30 fathoms; all on soft muddy bottom.

A very select form, which apparently finds its headquarters in these seas. The largest example dredged off Muscat measures in length 71 mm.

This exceedingly beautiful species is allied to *fulminata*, Kien. Found also at Aden (Shopland).

62. SURCULA CINGULIFERA (Lam.).

*Pleurotoma cingulifera*, Lamarck, Anim. sans Vert., vol. vii, 1822, p. 94.

    "    "    Reeve, Conch. Icon., vol. i, 1843, pl. i, f. 1.

P.G. Generally distributed in the Gulf, extending to the Gulf of Oman, 5-10 fathoms, sandy mud. The largest example, 1 $\frac{5}{8}$  inches in length, occurred in lat. 26° 50' N., long. 54° 50' E. It extends to the Philippines (Hidalgo).

Var. *amicta*, Sm.

*Pleurotoma amicta*, E. A. Smith, Ann. Mag. Nat. Hist., ser. iv, vol. xix, 1877, p. 488.

P.G. Gulf of Oman, off Jask, 180 fathoms, 1914.

I. Bombay (Abercrombie); Bassein Harbour as far south as Goa (Lieut.-Col. H. D. Olivier). This was first described from the Hawaiian Islands, and is reported from Aden (Shopland).

<sup>1</sup> Journ. de Conch., tom. lxi, 1913, p. 136.

## 63. SURCULA FULMINATA (Kien.).

*Pleurotoma fulminata*, L. C. Kiener, Coq. Viv., 1839, pl. x, f. 2.

„ „ Reeve, Conch. Icon., vol. i, 1843, pl. v, f. 37.

„ *tornata*, Dillwyn, var. *fulminata*, Tryon, Man. Conch., vol. vi, 1884, p. 237, pl. vi, f. 81.

P.G. Mussandam, 27 fathoms. Gulf of Oman, Muscat, 5–10 fathoms; lat. 25° 32' N., long. 57° 47' E., 175 fathoms. Off Kuh i Mubarik, 25 miles west of Jask, 1914.

M.C. Generally distributed.

I. Karachi. Bombay (F. W. T.) (Abercrombie); Bassein and Bombay Harbour southwards to Goa (Olivier). It is also reported as far east as Java.

Var. *gloriosa*, nov. (Pl. VIII, Fig. 11.)

Testa breviter fusioidea, obesa, lævi, undique leviter arcte spiraler striatula, anfractibus 9–10, quorum supernis duobus hyalinis, lævissimis globulosis, his proximis tribus minute spiraler gemmatis, cæteris turrito-gradatis, infra suturas transversa callositate prominula præditis, deinde paullum excavatis, ultimo lævi, infra peripheriam multilirato, superficie brunneo vittata, et lineis fulgetrinis vel maculis conspersis decorata, apertura oblonga, alba vel pallide straminea, labro tenui, sinu lato, haud profundo, canali breviter producto. Long. 44, lat. 20, sp. max.; long. 40, lat. 16, sp. min.

P.G. Basadu. Jask, found on the beach.

Two specimens only, almost precisely similar, have as yet occurred of this form. The first, from Basadu, was the smaller, but more perfect as regards the nuclear whorls, the latter possessing the finer coloration.

Mr. Edgar Smith, who only examined the Basadu shell, expressed to me the opinion that it might be only a monstrous squat form of *fulminata*, but the discovery of a second shell emboldens me to propose for it varietal rank. It is wonderfully like *Perrona obesa* (Reeve) in form, and that is given undoubted specific status. At all events it is a handsome addition to the genus, its symmetry is admirable, and, should large suites of specimens occur in the future, recognition of its specific merits would undoubtedly have to be seriously considered.

## 64. SURCULA HALICYRIA, Melv.

*Surcula halicyria*, Melvill, Proc. Malac. Soc. Lond., vol. vi, 1904, p. 164, pl. x, f. 16.

P.G. Gulf of Oman, lat. 24° 49' N., long. 58° 56' E., 228 fathoms, mud bottom (October 26, 1900).

Unique at the present time, the type being in the National Collection. Allied to *S. undatiruga*, Biv., from the Mediterranean Sea, from which, however, it differs altogether in sculpture.

## 65. SURCULA JAVANA (L.).

*Murex javanus*, Linnæus, Syst. Nat., 12th ed., 1767, p. 550.

*Pleurotoma nodifera*, Lamarck, Anim. sans Vert., vol. vii, 1822, p. 96.

„ „ Reeve, Conch. Icon., vol. i, 1843, pl. iv, f. 28.

I. Karachi, rare. Bombay (Abercrombie), east ashore very



Genus CLAVATULA, Lamarek, 1801.

68. CLAVATULA BIMARGINATA (Lamk.).

*Pleurotoma bimarginata*, Lamarek, Anim. sans Vert., vol. vii, 1822,  
p. 83.

„ „ Reeve, Conch. Icon., vol. i, 1843, pl. v, f. 34.  
P.G. Gulf of Oman, Jask beach.

As Lovell Reeve aptly remarks, the salmon-pink hue of this species is unique in the genus.

The west and south coasts of Africa are the usual habitats of the group of nearly allied species to which this belongs. Tryon<sup>1</sup> indeed merges them *all* under the collective name of *muricata*, Lamk.

69. CLAVATULA NAVARCHUS, Melv. & St.

*Pleurotoma (Gemmula) navarchus* (Melvill & Standen), Ann. Mag. Nat. Hist., ser. VII, vol. xii, 1903, p. 310, pl. xxi, f. 15.

*Clavatula navarchus*, E. A. Smith, Ann. Mag. Nat. Hist., ser. VII, vol. xviii, 1906, p. 160.

P.G. Gulf of Oman, lat. 25° 19' N., long. 58° 10' E., 140 fathoms. Off Jask at 175 fathoms.

M.C. Between Charbar and Jask, dredged at 90–200 fathoms, in company with *Conorbis coromandelicus*, Sm., and *Rostellaria delicatula*, Nevill.

This magnificent species is now, we consider, placed in its correct genus and sequence. One specimen is 3 inches in length. Excepting in size, there seems no variation. It also was dredged by the *Investigator* Expedition, at Station 258, west of Travancore, 102 fathoms, sand. And Mr. E. A. Smith remarks that "the operculum is rather thick, semi-oval, having one side straight and the outer margin curved. The nucleus is at the middle of the straight edge, the outer surface being finely concentrically striated, and the under-side with a raised edge, with some concentric wrinkles in the middle".<sup>2</sup>

III. Sub-family MANGILINÆ.

Genus MANGILIA, Risso, 1826.<sup>3</sup>

70. MANGILIA ADAMANTINA, Melv.

*Mangilia adamantina*, Melvill, Proc. Malac. Soc. Lond., vol. vi, 1904, p. 165, pl. x, f. 18.

P.G. Mussandam, 55 fathoms. Henjam Island. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms; and lat. 24° 54' N., long. 57° 55' N., 205 fathoms, mud.

<sup>1</sup> Man. Conch., vol. vi, 1884, p. 229.

<sup>2</sup> Ann. Mag. Nat. Hist., ser. VII, vol. xviii, 1906, p. 100.

<sup>3</sup> This genus was named by Risso after Mangili, the Italian zoologist. He unfortunately wrote it at first *Mangelia*, afterwards correcting this and giving it as now usually spelt.

M.C. Off Charbar, common, 40 fathoms.

A constant species, fairly widely distributed, gregarious and plentiful where found; easily recognizable, being small, of lozenge shape, white, with a single spiral keel, moderately ribbed longitudinally, and crossed with apical lines, apical whorls vitreous, globular, swollen, and proportionately large.

71. *MANGILIA ALBATA* (Sm.). (Pl. IX, Fig. 3.)

*Pleurotoma* (—?) *albata*, E. A. Smith, Ann. Mag. Nat. Hist., ser. v, vol. x, 1882, p. 210.

P.G. Henjam Island, 10 fathoms (1906); Linjah Anchorage, 7–15 fathoms, rarely; Mussandam, 55 fathoms; Gulf of Oman, Muscat.

M.C. Charbar, 10 fathoms.

A small hexagonal species, local, but frequent where it does occur. There was, however, no sign of it in the prolific dredging at 156 fathoms in the Gulf of Oman, though *quisquilia*, its ally, occurred there commonly. The author of the species experienced doubts as to its position, but I think *Mangilia* is the best genus for its reception, at all events until the wished-for revision of this vast family can be undertaken. The nuclear whorls are smooth, white, third whorl centrally angled.

72. *MANGILIA ALBOLABIATA* (Sm.). (Pl. VIII, Fig. 13.)

*Pleurotoma* (*Mangilia*?) *albolabiata*, E. A. Smith, Ann. Mag. Nat. Hist., ser. v, vol. xiv, 1882, p. 321.

P.G. Coll. Pelly (Type in the British Museum). Also off Henjam Island, 15–20 fathoms, mud.

M.C. Charbar.

I. Karachi; Bombay (Abercrombie), in shell sand, mostly worn.

*b. chilosema*, Melv.

*Mangilia chilosema*, Melvill, Ann. Mag. Nat. Hist., ser. vii, vol. iv, 1899, p. 85, pl. i, f. 3.

M.C. Charbar, 40 fathoms, and at several places off the coast of Baluchistan, at 10–15 fathoms.

I. Karachi, exceedingly abundant among loose rocks, sand, and mud at low tide.

The affinities of this species and its variety lie with the New Caledonian *M. himerta* and *himerodes*, Melv. & St., and likewise with *M. vauquelini*, Payr., from the Mediterranean region. Typical *albolabiata* measures 4.5 mm. longitudinally, as against 7 to 9 or even more in the variety. As will be seen by the figure, the outer lip of the type, though apparently mature, is hardly expanded, and the sinus is obscure. *Chilosema*, on the other hand, as originally described, has both these characters well portrayed; a certain angularity likewise is conspicuous in the upper part of each whorl.

Still, the forms occurring so much together, with intermediates, compel the grouping together of two extreme forms.

The dull reddish central lateral and dorsal interrupted band is a guide to the species. Lastly, with regard to the nuclear whorls, the first two are smooth and white, the third slightly ventricose and cancellate. This would betoken alliance with *M. gracilentia*, Reeve, its variety *portia*, Sm., etc.

73. *MANGILIA ALTICOSTATA*, Sowb.

*Mangilia alticostata*, G. B. Sowerby, Proc. Malac. Soc. Lond., vol. ii, 1896, p. 31, pl. iii, f. 16.

P.G. Henjam Island, 10 fathoms. Khor Khawi, 12 fathoms, coral sand (March 19, 1909).

The specimens from the first locality agree with those received "ex auctore" from St. Vincent's Gulf, South Australia. It is nearest to *M. ichthys*, Melv., but far more elongate, 9-whorled in the largest example examined. The type is pure white; but from Khor Khawi came an interesting variety with spiral interrupted brown band in the interstices between the costæ of the two last whorls, and on the body-whorl, in addition to this, a second central conspicuous brown band, better defined than the others. This might be called var. *fasciata*.

74. *MANGILIA ANARITHMA*, Melv.

*Mangilia anarithma*, Melvill, Proc. Malac. Soc. Lond., vol. x, 1912, p. 251, pl. xi, f. 12.

M.C. Charbar, 40-3 fathoms.

The ribs are more rounded and thicker than is the case with *M. zebuensis*, Reeve, which seems its near ally. The two apical whorls are smooth and white, the third longitudinally lirulate, sinus hardly expressed. Local, but common where it occurs.

75. *MANGILIA APOLLINEA*, Melv.

*Mangilia apollinea*, Melv., Proc. Malac. Soc. Lond., vol. vi, 1904, pl. x, f. 20.

P.G. Muscat, 10-20 fathoms. Henjam Island, 10 fathoms. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

M.C. Charbar, 40 fathoms.

Allied nearly to *M. infulata*, Hedley, from Australian waters.<sup>1</sup> *M. polita*, Hinds, *ebur*, and *opalus*, both of Reeve, are likewise of the same alliance.

The single conspicuous central spiral keel, crossing the ribs at right angles, and bearing a beaded gemmule at each point of junction, is a distinguishing feature of this very beautiful little *Mangilia*. The surface is otherwise completely smooth and shining. The distribution is mainly identical with that of *M. adamantina*, Melv.; the apical whorls are much smaller than in that species, though equally smooth and white. Dredged during the "Siboga" expedition at Great Kei Island (Schepman).

<sup>1</sup> Proc. Linn. Soc. New S. Wales, vol. xxxiv, 1909, p. 457, pl. xlv, f. 92.



76. *MANGILIA ARCTA* (Sm.). (Pl. IX, Fig. 10.)

*Pleurotoma* (*Daphnella*?) *arcta*, E. A. Smith, Ann. Mag. Nat. Hist., ser. v, vol. xiv, 1884, p. 325.

P.G. Type in British Museum collection.

A narrow cytharoid species, evidently a near ally of the protean *M. gracilentata*, Reeve; the granulately cancellate third whorl hints at identity with this, and also the form of the mouth and outer lip. But the mature shell is more abbreviate and considerably smaller. As the author points out, there is much variation in the colour; some specimens are white, others reddish, and we have examples from Hong-Kong of a dark greenish brown.

77. *MANGILIA AVERINA*, Melv. & St.

*Mangilia averina*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 441, pl. xxiv, f. 15.

I. Karachi.

An ally of *M. fairbanki*, G. & H. Nevill, *heptagona*, Dkr., *horneana*, Sm., etc. Pure white, with strong ribs, crossed by alternate strong or weak liræ, gemmuled at the points of junction. The type has the outer lip and columellar margin suffused with orange, but I have seen a variety with white lip and columella.

78. *MANGILIA BARBITON*, Melv.

*Mangilia barbiton*, Melvill, Proc. Malac. Soc. Lond., vol. vi, 1904, p. 166, pl. x, fig. 21.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

This species seems a link between *Mangilia* and *Cythara*, but is most probably placed correctly under the former name. A slight alliance with the rare *M. bathmis*, Melv., may also be traced; but this species is more gradate, and the sculpture is different.

79. *MANGILIA BATHMIS*, Melv.

*Mangilia bathmis*, Melvill, Proc. Malac. Soc., vol. vi, 1904, p. 57, pl. v, f. 4.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

Allied to *M. barbiton*, Melv., but the longitudinal ribs are far more incrassate, and it differs from *M. horneana*, Sm., in the canal being much more produced and the spiral ribs prominent. A very rare species.

80. *MANGILIA CALLICREDEMNA*, sp. nov. (Pl. X, Fig. 12.)

*M. testa minuta, alba, fulgida, ovato-fusiforimi, anfractibus 8, quorum duo apicales vitrei, perleves, duobus his proximis levibus, unicarinatis, cæteris quatuor suturaliter profunde impressis, ad medium angulatis, et longitudinaliter costulatis, costis incrassatis, levibus, ad angulum nodulosis, ultimo biangulato, binis ordinibus nodularum ad juncturas costarum ornato, deinde ad basim fortiter striato, striis ad 8-9, apertura oblique ovata, labro tenui, sinu*

perobscuro, margine columellari sinuata, canali lato, paullum producto. Long. 4·5, lat. 2 mm.

(καλλικρήθεμος, with beautiful head band.)

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

Akin to *M. pupiformis*, Sm., this small novelty occurred sparsely with it. It differs in several particulars, notably in form, being far less attenuate and cylindrical, the median whorls are all strongly uniangulate, and the body-whorl is not so lengthened, proportionately, as is that of *pupiformis*.

81. MANGILIA DECIPIENS (Sm.). (Pl. VIII, Fig. 14.)

*Pleurotoma (Mangilia) decipiens*, E. A. Smith, Ann. Mag. Nat. Hist., ser. VI, vol. ii, 1888, p. 312.

I. Bombay (A. Abercrombie), in shell sand, mostly worn.

The locality of the type is unknown. Nearly all the Bombay examples are worn and therefore not quite characteristic. The shell much resembles *M. albolabiata*, Sm., and may be a colourless variety of it. The three uppermost or nuclear whorls are described by the author as "leves"; this alone would distinguish it from its ally just mentioned, but all our specimens are beach-worn.

82. MANGILIA ERYMNA, sp. nov. (Pl. X, Fig. 6.)

*M. testa minuta, crassa, corrugata, pallide punicea, anfractibus 5, quorum duo apicales semiplanati, leves, tertio globulari, arcte cancellati, duobus ultimis rudicostatis, et spiraliter crassiliratis, numero costarum anfractus ultimi ad 10, lirarum ad 11, versus basim lira vel costa spirali fortiter prædita, deinde ad basim levi, sed multum incrassata, labro crasso, sinu obscuro vel absente, apertura anguste oblonga, canali brevissimo margine columellari obliquo, simplice. Long. 4, lat. 2 mm.*

(έρυμνος, fortified.)

I. Bombay. Type in the British Museum.

A curious, thickened, somewhat corrugate shell, of a pale pink colour, very minute, the third apical whorl globular and closely cancellate, the two lower whorls coarsely ribbed and spirally lirate, the lowest lira on the body-whorl very strongly ridged, while below this to the base the shell is fairly smooth, the outer lip very thickened, sinus hardly expressed, columellar margin oblique, simple. Allied to *M. horneana*, Smith, etc.

83. MANGILIA FAIRBANKI. G. & H. Nev.

*Mangilia fairbanki*, G. & H. Nevill, Journ. As. Soc. Bengal, vol. xlv, pt. ii, 1875, p. 85, pl. vii, f. 2.

I. Karachi, fine and not infrequent. Bombay (Abercrombie).

Messrs. Geoffrey and Hugh Nevill give Ceylon and the Andamans as localities for this species, and compare it with its near ally *M. hexagonalis*, Reeve. The curious leaden-pink colour seems very characteristic, as also the attenuation of spire. The nuclear whorls are smooth, sinus white, shallow, sutural. Named after the

late Rev. S. B. Fairbank, one of the pioneers of Indian molluscan research.

84. *MANGILIA FORTISTRIATA* (Sm.). (Pl. VIII, Fig. 12.)

*Pleurotoma (Mangilia) fortistriata*, E. A. Smith, Ann. Mag. Nat. Hist., ser. vi, vol. ii, 1888, p. 313.

I. Bombay (Abercrombie).

Distinguished by its few, very incrassate longitudinal costæ, otherwise allied to *M. decipiens*, Sm. Apical whorls as in that species, smooth and polished. We have not seen it north of Bombay.

85. *MANGILIA FULVOCINCTA*, G. & H. Nev.

*Mangilia fulvocincta*, G. & H. Nevill, Journ. As. Soc. Bengal, vol. xlv, pt. ii, 1875, p. 85, pl. vii, f. 1.

P.G. Bushire (a dark variety); Henjam Island; Gulf of Oman, Jask, 1906.

I. Bombay (Abercrombie).

The authors also name Ceylon and Pooree as localities. A well-marked species, its nearest allies being *M. pellyi*, Sm., and *querna*, Melv. The uppermost nuclear whorls are vitreous or white, third and fourth strongly keeled; the sinus to a great extent obsolete.

86. *MANGILIA GALIGENSIS*, Melv.

*Mangilia galigensis*, Melvill, Ann. Mag. Nat. Hist., ser. vii, vol. iv, 1899, p. 86, pl. i, f. 4.

P.G. Galig and Kharag Islands.

A handsome brownish species, allied to *M. townsendi*, Sowb., but differing in colour and the paucity, proportionately speaking, of longitudinal ribs. It has only been found on one occasion by Mr. Townsend.

87. *MANGILIA GRACILENTA* (Reeve). (Pl. IX, Fig. 12, var. *portia*, Smith.)

*Pleurotoma gracilentia*, Reeve, Proc. Zool. Soc. Lond., 1843, p. 184.

“ “ “ Conch. Icon., vol. i, 1843, pl. xiv, f. 114.

“ *contracta*, Reeve, Proc. Zool. Soc. Lond., 1843, p. 185.

“ “ “ Conch. Icon., vol. i, 1843, pl. xiv, f. 116.

*Mangilia gracilentia*, Reeve: Hedley, Proc. Linn. Soc. New S. Wales, vol. xxxiv, 1909, p. 456, pl. xlv, f. 91.

*Paraclathurella gracilentia*, Boettger, Nach. Deutsch. Malak. Gesell., Bd. xxvii, 1895, p. 56.

*Pleurotoma (Drillia) portia*, E. A. Smith, Ann. Mag. Nat. Hist., ser. v, vol. xi, 1884, p. 317.

? *Cythara elegantissima*, Melvill, Ann. Mag. Nat. Hist., ser. vii, vol. xii, 1903, p. 319.

P.G. Henjam Island; Mussandam, 30-55 fathoms; Koweit.

M.C. Gwadûr; Charbar, 40 fathoms.

Taking *M. contracta*, Reeve, which is evidently but a form of the widely spread *gracilentia* of the same author as an intermediate, I am forced to unite the *Pl. portia* of E. A. Smith. This seems to be the

commonest form in the Persian Gulf area, and its variety is great, both elongate and abbreviate forms occurring; others (as in the original type figured from the National Collection, which is that dredged by Sir Lewis Pelly in the Persian Gulf) have a wider mouth and sinus and shorter canal.

I suspect, too, that the shell described by me in 1903 as *Cythara elegantissima* is but another variety, and as such merge it provisionally.

*M. gracilentu* is placed in *Clathurella* by Hidalgo, in *Mangilia* by Hedley, in *Drillia* by Paetel. The peculiar swollen and cancellate third whorl are most distinctive, and when the time comes for the subdivision of these now much confused genera, I expect specific rank will be granted to the group ranged round this well-marked and widely distributed species, which is now only beginning to be understood, and to which will be relegated several other near allies, and consequently its synonymy will be extensive.

88. MANGILIA HORNEANA (Sm.). (Pl. IX, Fig. 15.)

*Pleurotoma* (*Clathurella*) *horneana*, E. A. Smith, Ann. Mag. Nat. Hist., ser. v, vol. xiv, 1884, p. 323.

P.G. Bushire.

I. Karachi. Amongst weed and rocks at low tide, locally most abundant, and probably extending much further south, to Ceylon and Madras.

The type is a gradate shell. The variety, with one or two more additional longitudinal costæ on each whorl, and closer, finer striation, may be thus characterized:—

Var. *compar*, nov. (Pl. X, Fig. 15.)

Testa ut in typo, sed nequaquam gradata, costis ad anfractus supernis magis numerosis, simul ac liris spiralibus tenuissimis, labro extus planato.

P.G. M.C. Fairly distributed.

Long. 8, lat.  $3\frac{1}{2}$  mm.

This smoother variety is more abundant than the type, as will be seen on reference to the original description, and we think it is a pity it was not taken as the leading exponent of the species. It is also larger than the type, now figured from the collection of the British Museum.

89. MANGILIA HEPTAGONA (Dkr.). (Pl. IX, Fig. 14.)

*Clathurella heptagona*, Dunker, Malak. Blätt., xviii, 1871, p. 161.

I. Bombay.

I have inspected specimens of this hitherto unfigured species in the British Museum, reported from the above locality, and give a figure of it. It belongs to the same "gens" as *scitula*, Reeve, and I should not deem it a *Clathurella*.

90. MANGILIA HEXAGONALIS (Reeve).

*Pleurotoma hexagonalis*, Reeve, Proc. Zool. Soc. Lond., 1845, p. 118.

„ „ „ Reeve, Conch. Icon., vol. i, 1845, pl. xxxii, f. 293.

P.G. Gulf of Oman, lat.  $24^{\circ} 58' N.$ , long.  $56^{\circ} 54' E.$ , 156 fathoms.

This is considered by Tryon (Manual, vol. vi, 1884, p. 251) to be identical with *M. obeliscus*, Reeve, but I doubt this. I am, indeed, not sure that the true *hexagonalis* has been found in the region now treated of, the specimens not being in first-class condition. I have *obeliscus* from Hong-Kong only. I may mention that *M. agna*, Melv. & St., from Lifu and Japan, placed under *hexagonalis* by Bouge & Dautzenberg,<sup>1</sup> is, in my opinion, a good species.

*M. pyramis*, Hinds,<sup>2</sup> another six-sided, small white form, is very similar, but the outer lip is more roundly expanded and the sinus not so prominent.

#### 91. MANGILIA ICHTHYS, Melv.

*Mangilia ichthys*, Melvill, Ann. Mag. Nat. Hist., ser. VIII, vol. vi, 1910, p. 13, pl. ii, f. 22.

P.G. Henjam Island; Mussandam, 55 fathoms.

M.C. Off Astola Island, 90 fathoms; Charbar, 40 fathoms (1906).

Allied to *M. obeliscus*, Reeve, which has not yet been found in this region, and *M. calcata*, Hedley, of which an unique specimen was dredged at 5-10 fathoms, off Hope Island, North Queensland, but, as pointed out by me in the description of *ichthys*, the characters of the sinus are altogether different in the two species. The ribs, too, of our species are more acute and strong; in *calcata*<sup>3</sup> they are well described as "oblique, wave-like, radial folds, five to a whorl, expanded and projecting prominently at the summit of each whorl". The very fine spiral threads running over the whole surface are a characteristic feature of both species in common. *M. alticostata*, Sowb., a South Australian species that appears to have found its way to the region now treated of, may possibly be an elongate form of *ichthys* or, perhaps, *calcata*.

#### 92. MANGILIA KOWEITENSIS, Melv.

*Mangilia koweitensis*, Melvill, Proc. Malac. Soc. Lond., vol. vi, 1904, p. 167, pl. x, f. 23.

P.G. Koweit, 10 fathoms.

A citharoid species, near *M. arcta*, E. A. Smith, with which I twice compared it, in the company of the author, and we determined it as quite distinct. Belonging to the *gracilentæ* "gens".

#### 93. MANGILIA LUCIDA (Sm.). (Pl. IX, Fig. 16.)

*Pleurotoma (Clathurella) lucida*, E. A. Smith, Ann. Mag. Nat. Hist., ser. v, vol. xiv, 1884, p. 323.

I. Bombay (Abercrombie).

Allied to *horneana*, Sm., *gradata*, Nevill, *myrmecodes*, Melv. & St., etc., but more coarsely costate, the costæ few in number, while the spiral liræ are likewise sparse and very incassate, about 10 only on the body-whorl. It has not yet occurred north of Bombay.

<sup>1</sup> Journ. de Conch., tom. lxi, 1913, p. 150.

<sup>2</sup> Reeve, Conch. Icon., vol. i, 1843, pl. xviii, f. 147.

<sup>3</sup> Proc. Linn. Soc. New S. Wales, vol. xxxiv, 1909, p. 456, pl. xlv, f. 90.

## 94. MANGILIA MUNDA (Sm.). (Pl. IX, Fig. 5.)

*Pleurotoma (Clathurella) munda*, E. A. Smith, Ann. Mag. Nat. Hist., ser. vi, vol. ii, 1888, p. 316.

P.G. Coll. Pelly. (Type in the British Museum.)

We figure the type of this small species, concerning which the author remarks: "This is especially remarkable for the fine yet very prominent thread-like lirations encircling the whorls. The longitudinal ribs are stout, rounded, and equalling in width the interstices between them." It has not occurred in Mr. Townsend's gatherings. There is a prominent tooth-like projection just below the sinus in the outer lip. It is allied to *M. scitula*, Sm.; so with a little diffidence I remove it from *Clathurella*. The apical whorls are smooth, vitreous.

## 95. MANGILIA MYRMECODES, Melv. &amp; St.

*Mangilia myrmecodes*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 442, pl. xxiv, f. 6.

M.C. Charbar, 5 fathoms, mud.

I. Karachi, not uncommon.

The noduled costæ are particularly well defined. It resembles *bascauda*, M. & St., from Lifu,<sup>1</sup> and also has affinities with *horneana*, Sm., and *erymna*, Melv., now just described. *M. lucida*, Sm., may likewise be compared. The sinus is sutural, nuclear whorls white, smooth. Might be considered equally a *Clathurella*; the section to which it belongs seems to link the two genera. *Cythara gradata*,<sup>2</sup> Nevill, likewise seems comparable, a species which I know only from a figure, not very conclusively drawn.

## 96. MANGILIA OLIVIERIANA, sp. nov. (Pl. X, Fig. 7.)

*M. testa parva, tenui, albo-lactea vel paullum cærulescente, fusi-formi, periostraco evanido ochreo-brunneo tenuissime contacta, anfractibus 8, quorum apicales 3 leves, tertio unicarinato, cæteris indistincte costellatis, et spiraliter rudiliratis, liris distantibus, ad suturas impressis, apertura patula, labro subexpanso tenui, sinu lato sed haud profundo, columella fere recta, canali brevissimo.*

Long. 9, lat. 3 mm.

M.C. Off Charbar, 110 fathoms (1913).

A thin species, which one might expect, being so melanoid in 'facies', might live in brackish water, but this is evidently not the case, for it is abysmal in its distribution. It resembles no *Mangilia* we are cognizant of. Of a milky-white or bluish colour, with an olive-brown fugitive epidermis, it is 8-whorled, three being only very slightly costellate, and crossed with coarsish distant raised lines; the mouth is singularly wide, outer lip thin, sinus wide but very shallow, columella straight. A few examples occurred gregariously in the above dredging. I have the great pleasure in connecting with this interesting shell the name of a relative, Lieut.-Col. Henry D. Olivier, who, with his

<sup>1</sup> Journ. of Conch., vol. viii, 1896, p. 279, pl. ix, f. 13.

<sup>2</sup> Journ. As. Soc. Bengal, vol. xlv, pt. ii, 1875, p. 93, pl. vii, f. 18.



sister, Miss Maud Olivier, has given very great assistance in both collecting and cataloguing the marine Mollusca of Bombay and neighbouring coasts.

97. *MANGILIA OPALUS* (Reeve).

*Pleurotoma opalus*, Reeve, Proc. Zool. Soc. Lond., 1845, p. 112.

„ „ „ „ Conch. Icon., vol. i, 1845, pl. xxx, f. 274.

I. Lat. 18° 58' N., long. 71° 45' E., 40 fathoms.

Only occurred in these seas on the one occasion mentioned just above. There is close alliance between this species (described originally from Cayagan, Island of Mindanao, Philippines) and *Pl. ebur*, Reeve (Conch. Icon., species 275). *M. polita*, Hinds, is also near, and also, I should infer, *M. apollinea*, Melv., from these same seas, as well as *M. infulata*, Hedley, from Australia. Size seems made too important a feature in the apportionment of species of this group to the various subsidiary genera, as our shell, excepting for this particular, possesses the labial and oral attributes of a *Drillia*.

98. *MANGILIA PELYI* (Sm.). (Pl. IX, Fig. 9.)

*Pleurotoma (Mangilia) pelyi*, E. A. Smith, Ann. Mag. Nat. Hist., ser. v, vol. x, 1882, p. 218.

P.G. Coll. Pelly. (Type in the British Museum.) Also Gulf of Oman, lat. 24° 55' N., long. 57° 59' E., 250 fathoms.

This shell, whose two near allies appear to be *M. fulvocincta*, G. & H. Nevill, and *M. querna*, Melv., differs from the former in its far more abbreviate contour, from the latter in its fine spiral striation. It was named in honour of the late Sir Lewis Pelly,<sup>1</sup> the then (1862-71) Political Agent for the Persian Gulf district, who was the first to employ the dredge in obtaining marine Mollusca from these seas, his collections being generously bestowed on the British Museum by the late Mr. R. MacAndrew.

99. *MANGILIA PERLONGA*, Melv.

*Mangilia perlonga*, Melvill, Ann. Mag. Nat. Hist., ser. VII, vol. iv, 1899, p. 87, pl. i, f. 5.

P.G. Muscat, 10-12 fathoms.

I. Karachi, only once found.

More regular in form and longer than *perplexa*, Nevill, which is allied. Apical whorls smooth, globular, vitreous-white, the third and fourth carinate, sinus situate just below the suture, broad but not deep.

100. *MANGILIA PERPLEXA* (G. & H. Nev.).

*Clathurella perplexa*, G. & H. Nevill, Journ. As. Soc. Bengal, vol. xlii, pt. ii, 1875, p. 89, pl. vii, f. 5.

P.G. Bushire, and near Fao, at the head of the Gulf.

I. Bombay (Abercrombie). Also occurring in Ceylon.

<sup>1</sup> At that time Colonel, afterwards Lieut.-General Sir Lewis Pelly, K.C.B., K.C.S.I., b. 1824, d. 1892, late M.P. for Hackney.

Compared with *M. fairbanki*, Nevill, by the authors, and yet placed in a different genus. The fact is that *Mangilia* and *Clathurella*, though distinct enough in the extremes, are yet so linked by species bearing common characteristics as to be often impossible to define satisfactorily. None of the specimens I have seen are apically perfect, and the authors do not mention their apical characters; but I consider this species allied to others now placed in *Mangilia*, and class it there accordingly.

## 101. MANGILIA PHÆA, Melv. &amp; St.

*Mangilia phæa*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 442, pl. xxiv, f. 7.

P.G. Linjah, 3½ fathoms, sand.

One of the most uncommon species, very small (long. 4, lat. 1 mm.), angular, of a peculiar dark-brown suffused coloration, few-ribbed, crossed by sparse liræ, commencing slightly above the centre of each whorl. We cannot well compare it with any other known species.

## 102. MANGILIA POLITA (Hinds).

*Clavatula polita*, R. B. Hinds, Proc. Zool. Soc., 1843, p. 43.

„ „ Reeve, Conch. Icon., vol. i, 1843, pl. xviii, f. 150.

*Drillia continua*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. VII, vol. xii, 1903, p. 312, pl. xxii, f. 17.

*Daphnella polita* (Hinds), Tryon, Man. Moll., vol. vi, 1884, p. 311, pl. xx, f. 59.

P.G. Mussandam, 47 fathoms; Henjam Island.

Although Reeve's figure of the type exhibits a more attenuate shell than ours, with produced canal, yet we have compared it with our specimens closely at the British Museum, and are satisfied as to their identity. The original specimen came from the Straits of Macassar, Celebes, and was dredged at a depth of 7 fathoms. Allied to *D. opalus* and *ebur*, Rve., and certainly not a *Daphnella*.

## 103. MANGILIA POSIDONIA, Melv.

*Mangilia posidonia*, Melvill, Journ. Malac., vol. xi, 1904, p. 84, pl. viii, f. 14.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

Near *M. adamantina*, Melv., from the same locality, but quite distinct, in my opinion. It is not so squarely angular, the two apical whorls are large and vitreous, third whorl flexuously radially costellate, the shell more fusiform in contour, more closely ribbed, the ribs and crossing liræ more acute, sharply defined and almost echinate at the points of junction.

## 104. MANGILIA PUPIFORMIS (Sm.).

*Pleurotoma* (*Drillia*?) *pupiformis*, E. A. Smith, Ann. Mag. Nat. Hist., ser. v, vol. xiv, 1884, p. 319.

*Mangilia callistephana*, Melvill, Proc. Malac. Soc. Lond., vol. vi, 1904, p. 166, pl. x, f. 22.

P.G. Coll. Pelly. (Type in British Museum.) Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms, very abundant.

The type-specimens collected by Sir Lewis Pelly are in poor condition, but I have but little doubt are the same as my *callistephana*, described twenty years later. Nuclear whorls smooth, second and third carinate. The double row of nodules encircling the whorls at the ribs, and the very narrow cylindrical contour, distinguish this interesting little shell. There is, however, a near ally in the same dredging, which I have described in this paper under the name of *M. callicredemna*.

105. *MANGILIA PYCNOCHILA*, Melv.

*Mangilia (Glyphostoma) pycnochila*, Melvill, Proc. Malac. Soc. Lond., vol. v, 1904, p. 58, pl. v, f. 6.

P.G. Mussandam, 47 fathoms.

Allied to *M. terpnisma*,<sup>1</sup> M. & St., but with much thickened outer lip and abbreviate contour. I now doubt its being a *Lienardia* (= *Glyphostoma*), the columella is plain and smooth, and the general 'facies' that of the typical genus. It has only occurred in small quantity.

106. *MANGILIA QUERNA*, Melv.

*Mangilia querna*, Melvill, Ann. Mag. Nat. Hist., ser. VIII, vol. vi, 1910, p. 13, pl. ii, f. 23.

P.G. Gulf of Oman, lat. 24° 52' N., long. 57° 35' E., 205 fathoms.  
M.C. Off Charbar, at 40 fathoms.

A smooth form, allied to *M. fulvocincta*, Nevill, and *pellyi*, Sm., but differing in the absence of fine spiral striæ over the whorls, which both these species possess. The shell varies in colour from pure white to oaken-brown.

107. *MANGILIA QUISQUILIA* (Melv. & St.).

*Clathurella quisquilia*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. VII, vol. xii, 1903, p. 315, pl. xxiii, f. 7.

P.G. Mussandam, 47 fathoms. Malcolm Inlet (Kubbatt Ghazira), large examples. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

M.C. Charbar, 40 fathoms.

Evidently not a *Clathurella*, but, like *M. albata*, Sm., which is an ally, we are not sure about its true generic position. It is very abundant in the latter dredging mentioned, whence came so many novelties. The figure quoted hardly does it justice, the outer lip not being perfect in the specimen figured. The sinus is wide, but shallow, the longitudinal costæ of the body-whorl numbering eight. The shell is a pure white in all the specimens examined. It appears most nearly allied to *Pleurotoma turris*, Reeve (Conch. Icon., vol. i, pl. xxxvii, fig. 344). This is an olive-brown species, reported also from the Persian Gulf district, first called *pagoda* by Reeve, an already occupied name, from, to quote his words, "the strong ribs continuing one under the other, and providing a peculiar pagoda-like form." This character, however, does not seem

<sup>1</sup> Proc. Zool. Soc. Lond., 1901, p. 443, pl. xxiv, f. 8.

noticeable in *quisquilia*. Again, the third whorl in *turris* is closely radially ribletted. The two nuclear whorls are globular and very smooth in both species.

108. *MANGILIA RECTA* (Sm.).

*Pleurotoma* (*Mangilia*?) *recta*, E. A. Smith, Ann. Mag. Nat. Hist., ser. VI, vol. II, 1888, p. 310.

*Mangilia recta*, Sm.: Melvill, Proc. Malac. Soc. Lond., vol. X, 1912, p. 251, pl. XI, f. 13, 13a.

P.G. Coll. Pelly. (Type in the British Museum.)

M.C. Charbar, 7 fathoms.

A distinct species, with a peculiar waxy appearance, and greyish-olive in colour, striped with whitish. One of the Charbar specimens, in better condition than the actual type, was figured as given above.

The author particularly calls attention to the granular aspect of the third whorl, which is somewhat of the same character as those of *M. albolabiata*, Sm., *gracilentia*, Reeve, and its variety *portia*, Sm.

109. *MANGILIA SCITULA* (Sm.). (Pl. IX, Fig. 4.)

*Pleurotoma* (*Mangilia*) *scitula*, E. A. Smith, Ann. Mag. Nat. Hist., ser. V, vol. XIV, 1884, p. 321.

P.G. Mussandam, 55 fathoms. Muscat, 10-15 fathoms. Gulf of Oman, lat. 24° 58' E., long. 56° 54' N., 156 fathoms.

M.C. Charbar, 40 fathoms.

I. Karachi.

An abundant little white species, hitherto unfigured. The fusiform contour narrowed below, with rather small mouth, proportionately speaking, swollen upper whorls, and coarse spiral liræ, hexagonal, as remarked by the author, with very beautiful spiral, minutely punctate striæ between the lirations just mentioned. The type, now figured, was collected by Sir Lewis Pelly in the Gulf.

110. *MANGILIA SMITHII* (G. & H. Nev.).

*Clathurella smithii*, G. & H. Nevill, Journ. As. Soc. Bengal, vol. XLIV, pt. II, 1875, p. 88, pl. VIII, f. 13.

P.G. Tumb Island.

M.C. Gwadûr (W. T. Blanford).

The type has a clear space below the sutures to the centre of each whorl.

Var. *clarisculpta* (Melv.).

*Mangilia clarisculpta*, Melvill, Proc. Malac. Soc. Lond., vol. X, 1912, p. 251, pl. XI, f. 13, 13a.

P.G. Mussandam, 55 fathoms. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

M.C. Charbar, at 40 fathoms.

Differs from the type in the very conspicuous and prominent spiral excavate ridge (or ridges) just below the sutures, especially on the penultimate and body whorls. I had not noted that G. & H. Nevill call attention to this variation from their type in the original

description, and since I find the two forms together, though *clarisculpta* is very much the commoner in the region we are treating of, I am inclined to agree with the authors, and class my species as a good variety. The two apical whorls in both this and the typical species are white, smooth, somewhat vitreous.

111. MANGILIA TERPNISMA, Melv. & St.

*Mangilia terpnisma*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 443, pl. xxiv, f. 8.

P.G. Gulf of Oman, Muscat, 15 fathoms. Lat.  $24^{\circ} 58' N.$ , long.  $56^{\circ} 54' E.$ , 156 fathoms. Also lat.  $25^{\circ} 6' N.$ , long.  $60^{\circ} 39' E.$ , 40 fathoms, and contiguous soundings, *vide* original description.

Fine live examples are tinged with brown-red round the columella and outer lip. It seems locally abundant. It may by some be considered a *Glyphostoma*, but without much reason. *M. pynochila*, Melv., is the nearest ally, perhaps, indeed, a marked variety with abnormally thickened labrum. It was dredged off Timor in the *Siboga* expedition.

112. MANGILIA THALIA (Melv. & St.).

*Clathurella thalia*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 445, pl. xxiv, f. 10.

M.C. Charbar, 7 fathoms.

Very nearly allied to *portia*, Sm. = *gracilentia*, Reeve, and perhaps it had better be relegated to a variety of that protean form. It differs in its more graceful, fusiform shape, in the ochraceous colour, with brown tinge around the centre of the whorls, and in greater flexuosity of costæ, the spiral liræ at the point of junction with the ribs being gemmulate; the canal is shorter than generally obtains in *gracilentia*, but we require larger suites of specimens before the question can be actually decided.

113. MANGILIA THESKELOIDES, Melv.

*Mangilia theskeloides*, Melvill, Ann. Mag. Nat. Hist., ser. VII, vol. iv, 1889, p. 87, pl. i, f. 6.

I. Karachi.

As stated in the original description, this species differs much from its congeners in the Persian Gulf area, and is more nearly allied to certain New Caledonian species, e.g. *bella* and *interrupta*, Reeve, or *theskela*, Melv. & St.

114. MANGILIA TOWNSENDI, Sowb.

*Mangilia townsendi*, G. B. Sowerby, Proc. Malac. Soc. Lond., vol. i, 1895, p. 278, pl. xviii, f. 1, 2.

P.G. Henjam Island, Gulf of Oman. Especially fine at Jask.

M.C. Charbar, Gwadûr, Ormara, Astola Island, etc.; met with generally along the coast from low-water mark to 15 fathoms, on muddy sand.

The author compares this beautiful species to *M. attenuata*, Mont., a European species. The colour described happily as "griseo-virescens" is peculiar. *M. galigensis*, Melv., is the only near ally in the seas now treated of.

115. *MANGILIA TRITÆNIATA*, sp. nov. (Pl. X, Fig. 5.)

M. testa parva, fusiformi, pallide livido-lutescente, apud basim leniter puniceo-tincta, anfractibus 8, quorum apicales duo vel tres leves, globulares, quarto arcte cancellato, cæteris apud suturas multum impressis, longitudinaliter costatis, costis subacutis; in numero ultimum apud anfractum 15, undique spiraliter tenuiliratis, supernis una, ultimo tribus tæniis læte rufis ornato, apertura anguste oblonga, labro tenui, fortasse adolescente, sinu obscuro, columella simplice, obliqua, canali producto. Long. 8, lat. 2·5 mm.

(*tritaniatus*, thrice-banded.)

*Hab.*—Bombay. (Type in the British Museum.)

Perhaps not full grown, this interesting little species possesses a peculiarity in form, being in miniature much like a *Mitra* of the section *Turricula* both in form and disposition of coloration pattern, the triple band around the body-whorl being notable. The whorls are all considerably suturally impressed and ventricose, multicostate, and spirally finely lirate.

116. *MANGILIA TURRIS* (Reeve).

*Pleurotoma pagoda*, Reeve, Conch. Icon., vol. i, 1846, pl. xxxvii, f. 344; non *pagodus*, Reeve, *t.c.*, 1845, pl. xxvii, f. 242.

„ *turris*, Reeve, *t.c.*, 1846, erratum.

*Drillia turris*, Tryon, Man. Conch., vol. vi, 1884, p. 210, pl. xv, f. 30.

P.G. Gulf of Oman. Muscat, 10–20 fathoms.

I. Karachi, but very rarely.

I consider that this species, with its allies, *quisquilia*, Melv., and *albata*, Sm., had best be considered *Mangiliæ*. This is a dark-brown shell, very attenuate, and closely spirally lirate throughout. I have specimens from Hong-Kong. It is a narrower species than *quisquilia*, also found in the same seas.

117. *MANGILIA WOODWARDLE*, sp. nov. (Pl. X, Fig. 9.)

M. testa lata, fusiformi, solidula, sordide alba, anfractibus 7, quorum apicales 2 vitrei, globulares, tertio unicarinato, cæteris ad medium acutangulis, undique longitudinaliter obliquicostatis, costis ultimum apud anfractum ad 8, superficie levi, apud basim ult. anfractus paucilirata, apertura angusta, intus albescens, labro incrassato, sinu perobscuro, margine columellari ad basim recta, canali paullulum producto. Long. 9, lat. 4 mm.

P.G. Mussandam, 30 fathoms.

An interesting form, of which only one specimen was obtained. It seems to me sufficiently distinct, however, from the known recent species to attempt a description. The broadened fusiform contour, conspicuous central acute angle in the lower whorls, thickish oblique ribs, characterize it fully, the only ally known to me being *scalata*, Soubervie, from New Caledonia, with which Tryon merges *melanostoma*, Garrett, from Fiji, and *angicostata*, Reeve, from the same locality. These all seem, however, to differ considerably.

Reeve describes his *angicostata* (Conch. Icon., vol. i, pl. xxxvi, f. 327) as “a pure white hexagonal shell”; our species is eight-angled, and



is only half the size—9 as against 18 mm. *Melanostoma*, Garrett, is noted for its nigrescent columellar region, and *scalata*, Souv., from New Caledonia, is considerably larger than our shell, with a conspicuous interrupted black spiral band in the central portion of the interstices of each whorl, between the ribs, otherwise entirely pure white. I have much pleasure in honouring this little shell with the name of Miss Gertrude M. Woodward, who has so finely drawn the illustrations that accompany this paper.

118. MANGILIA ZEBUENSIS, Rve.

*Mangilia zebuensis*, Reeve, Proc. Zool. Soc. Lond., 1846, p. 65.

P.G. Gulf of Oman, 205 fathoms.

This little species, described originally from I. Cebu (or Zebu), Philippines, is evidently of wide distribution. I have examples from the locality just named—Cebu—which are larger than others from Singapore (coll. Archer) kindly presented me by Mr. Le Brockton Tomlin. The longitudinal ribs are sharply cut, and once angled centrally.

Genus CYTHARA, Schumacher, 1817.

119. CYTHARA EDITHÆ, Melv. & St.

*Cythara edithæ*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 446, pl. xxiv, f. 11.

P.G. Henjam Island, 15 fathoms (April, 1906).

Gulf of Oman, Muscat, 10 fathoms.

A neat and regularly formed species, with six clearly-cut costæ on the penultimate and body whorls, surface closely finely striated, yellowish-white, ribs here and there flecked with pale reddish-brown maculations, the columellar margin is minutely multidenticulate.

120. CYTHARA ELEVATA, Sm.

*Cithara elevata*, E. A. Smith, Ann. Mag. Nat. Hist., ser. v, vol. xiv, 1884, p. 327.

P.G. Coll. Pelly. (Type in the British Museum.)

This is the only species described by Mr. E. A. Smith from the Persian Gulf that I have failed to find in the National Collection. By the description it seems quite distinct from the few other *Cytharæ* found in this region, *C. edithæ* appearing its nearest congener.

The locality of "Bushire" given by us in our former Catalogue to a shell erroneously called *Drillia elevata*, Sm.,<sup>1</sup> is inexplicable, and should be erased.

121. CYTHARA GRADATA, G. & H. Nev.

*Cythara gradata*, G. & H. Nevill, Journ. As. Soc. Bengal, vol. xlv, pt. ii, 1875, p. 93, pl. vii, f. 15.

I. Bombay (Rev. S. B. Fairbank).

A species of which I have seen no satisfactory, if genuine, specimens. It was named by Mr. Abercrombie and myself in our Bombay list as

<sup>1</sup> Proc. Zool. Soc. Lond., p. 437 (1901).

found by the former, but the shells were worn and upon re-examination they seem nearer typical *M. horneana*, Sm. The figure above referred to is not well drawn, and the type being in the Indian Museum, Calcutta, adds to the difficulty.

122. CYTHARA HYPERCALLES, Melv.

*Cythara hypercalles*, Melvill, Mem. Manch. Soc., vol. xlii, No. 4, 1898, p. 12, pl. i, f. 5.

P.G. Gulf of Oman, Muscat, 20 fathoms, sandy mud.

An elegant and very local species. Much larger than any form of *C. cylindrica*, Reeve.

123. CYTHARA LYRICA (Reeve). (Pl. X, Fig. 3.)

*Mangilia lyrica*, Reeve, Proc. Zool. Soc., 1846, p. 61.

„ *cylindrica* var., Reeve, Proc. Zool. Soc., 1846, p. 60.

„ *cylindrica* and *lyrica*, Reeve: Tryon, Man. Conch., vol. vi, 1884, pp. 267, 268, pl. xxiv, figs. 9, 21.

P.G. Henjam Island.

Many examples occurred, but all in dead condition. Reeve, followed by Tryon (Man. Conch., vi, 1884, pp. 267, 268), distinguished two species, *cylindrica* and *lyrica*, but E. A. Smith, discussing this with the writer, considered it was impossible to separate them. I hardly think I agreed with this entirely.

124. CYTHARA STRIATELLA, Sm. (Pl. X, Fig. 4.)

*Cithara striatella*, E. A. Smith, Ann. Mag. Nat. Hist., ser. v, vol. xiv, 1884, p. 327.

P.G. Coll. Pelly. (Type in the British Museum.)

We figure the type of this species, which has not occurred in the Townsend collections. It is distinguished by its seven prominent ribs, which are not continuous up the spire, but are irregularly disposed, to quote from the author's diagnosis.

125. CYTHARA TYPHONOTA, Melv. & St.

*Cythara typhonota*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 446, pl. xxiv, f. 12.

P.G. Tumb Island, 17 fathoms, sand.

Characterized chiefly by its gradate whorls, well-ribbed, and with a smoky-black band spreading over the lower portion of the dorsal surface, most conspicuous just behind the outer lip. Only two specimens have yet been found.

Genus LIENARDIA, Jousseume, 1884 (= GLYPHOSTOMA, auctt. non Gabb, 1872).

126. LIENARDIA ARMSTRONGII (G. & H. Nev.).

*Clathurella armstrongii*, G. & H. Nevill, Journ. As. Soc. Bengal, vol. xlv, pt. ii, 1875, p. 93, pl. vii, f. 13.

I. Bombay (Abercrombie).

This species was originally recorded by the authors from the Paumben (or Pamban) Straits, South India, and is also Andamanese.

The beach-worn specimens collected as above have been identified with doubt, it being impossible to compare them with the types, now in the Indian Museum, Calcutta, with the rest of the Nevill collections. The figure gives a nodulous appearance to the columellar margin, and as "*Pleurotoma*" *arctata*, Reeve, so nearly allied to *spurca*, Hinds, is named as the nearest ally, it seems only equitable to propose its transference to the genus *Lienardia*.

## 127. LIENARDIA BIPPLICATA (Melv.).

*Mangilia biplicata*, Melvill, Proc. Malac. Soc. Lond., vol. vii, 1906, p. 77, pl. viii, f. 21.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

The double columellar plication, and the similarity to *L. spurca* (Hinds), in miniature, induce me to change the position of this species, and introduce it as a *Lienardia*, as I have provisionally done in the case of the last species.

## 128. LIENARDIA CARDINALIS (Reeve).

*Pleurotoma cardinalis*, Reeve, Proc. Zool. Soc. Lond., 1845, p. 115.

" " " " Reeve, Conch. Icon., vol. i, 1845, pl. xxx, f. 266.

*Mangilia* " " Tryon, Man. Conch., vol. vi, 1884, p. 258, pl. xv, f. 14.

*Glyphostoma cardinale*, Bouge & Dautzenberg, Journ. de Conch., tom. lxi, 1913, p. 173.

I. Karachi, 3 fathoms, loose stone bottom.

I have not seen the specimens reported from Karachi. It is allied to *M. rava*, Hinds,<sup>1</sup> according to Reeve. This is a species intermediate between *spurca*, Hinds, and *bicolor*, Angas. The type, as figured, exhibits a smoothish, spirally banded shell. I have examined this in the National Collection, but failed to identify any Persian Gulf *Mangiliae* with it. Included in *Clathurella*,<sup>2</sup> it is quoted by Hidalgo as from the Isle of Negros, Philippines.

## 129. LIENARDIA COMIDELEUCA (Melv. &amp; St.).

*Mangilia comideleuca*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. vii, vol. xii, 1903, p. 313, pl. xxiii, f. 5.

P.G. Mussandam, 47-55 fathoms.

Gulf of Oman, 37 fathoms.

This local species has been well figured; it evidently belongs to the same alliance as *spurca*, Hinds. Live examples are shining white, here and there tinged with stramineous suffusion occasionally.

## 130. LIENARDIA CRASSILABRUM (Reeve).

*Pleurotoma crassilabrum*, Reeve, Proc. Zool. Soc., 1843, p. 185.

" " " " Reeve, Conch. Icon., vol. i, 1843, pl. xiv, f. 118a, b, c.

P.G. Malcolm Inlet (Kubbatt Ghazira), 3 fathoms.

I. Karachi.

<sup>1</sup> Hinds, Moll. Voy. *Sulphur*, 1884, p. 17, pl. v, f. 18.

<sup>2</sup> Hidalgo, Cat. Moll. Tert. Filipinas, 1904, p. 123.

I believe this species to be widely spread, though there are not many records extant. Bouge & Dautzenberg recognize it from Lifu and I. Ticao, Philippines.<sup>1</sup>

131. LIENARDIA CREBRILIRATA (Sm.). (Pl. IX, Fig. 17.)

*Pleurotoma (Clathurella?) crebrilirata*, E. A. Smith, Ann. Mag. Nat. Hist., ser. v, vol. xiv, 1884, p. 324.

P.G. Coll. Pelly. (Type in the British Museum.)

A species on the borderland between *Mangilia* and *Clathurella*, the apical whorls being smooth and the surface hardly cancellate. The type here figured is now in the British Museum.

Judging by the general formation of the shell, alliance with *L. armstrongii*, Nevill, is suggested. Apical whorls plain, not cancellate. This caused the author to hesitate about its location. I place it, provisionally only, in *Lienardia*.

132. LIENARDIA DITYLOTA (Melv.).

*Clathurella ditylota*, Melvill, Proc. Malac. Soc. Lond., vol. x, 1912, p. 252, pl. xii, f. 17.

P.G. Koweit, 11 fathoms. Bunder Abbas, 3-10 fathoms (1907). Henjam Island, 5-10 fathoms. Linjah Anchorage.

Gulf of Oman, lat. 25° 6' N., long. 60° 34' E. (1914), 60 fathoms. Muscat, 10 fathoms.

M.C. Astola Island, Gwadûr, Charbar.

I. Karachi. Bombay, dead specimens.

A common species in these seas, and undoubtedly a *Lienardia*. It has till recently been confounded with *Cl. polynesiensis*,<sup>2</sup> Reeve, of which the type came from Lord Hood's Island (Cuming). This last, which is also an abundant New Caledonian species, does not really run at all near the *L. ditylota*, and it is extraordinary and unaccountable they should have been considered identical. The name must therefore be entirely erased from our former catalogue (Proc. Zool. Soc. Lond., 1901, p. 445).

133. LIENARDIA OBTUSICOSTATA (Sm.).

*Pleurotoma (Glyphostoma) obtusicostata*, E. A. Smith, Ann. Mag. Nat. Hist., ser. v, vol. x, 1882, p. 304.

„ „ „ Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 444, pl. xxi, f. 4.

P.G. Koweit. Gulf of Oman. Muscat, 10 fathoms.

M.C. Locally abundant all along the coast of Baluchistan.

I. Karachi. Bombay (Abercrombie).

It has been noted as far south as Quilon (Captain Tindall).

A well-marked species, the nearest allies of which are *L. spurca* (Hinds) and *bicolor*,<sup>3</sup> Angas, likewise *L. alliteratum*, Hedley, these two last being Australian species. The brownish ochreous shading of

<sup>1</sup> Journ. de Conch., tom. lxi, 1913, p. 175.

<sup>2</sup> Conch. Icon., vol. i, 1845, pl. xxxiii, f. 304.

<sup>3</sup> Proc. Linn. Soc. New S. Wales, vol. xxxix, 1914, p. 728.

the former of them at the base of the body-whorl is distinctive; all the genuine specimens of this in my collection are so coloured. It is a narrower shell, too, than Hedley's new species. I doubt the occurrence of true *bicolor* in these seas, as has been reported (Proc. Zool. Soc. Lond., 1901, p. 444) in our former catalogue. It may be, however, that in time connecting links between these two nearly allied species may be found.

134. LIENARDIA PULCHRIPICTA (Melv. & St.).

*Mangilia pulchripicta*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 443, pl. xxiv, f. 9.

P.G. Mussandam, 55 fathoms. Bushire, towards Fao, Gulf of Oman, lat. 20° 55' N., long. 37° 57' E., 37 fathoms.

Distinguished by the purplish blotches placed interstitially in the centre of the body-whorl, as is the case with *Drillia intertincta*, Sm. It seems allied to *spurca* (Hinds), so we place it, provisionally, in the same genus. But few examples have as yet been collected.

135. LIENARDIA RUGOSA (Mighels).

*Pleurotoma rugosa*, Mighels, Proc. Boston Soc. N.H., vol. ii, 1845, p. 23.

P.G. Gulf of Oman, Muscat, 15 fathoms.

I. Karachi, in 3-7 fathoms, amongst loose stones and muddy sand. A widely distributed species throughout the eastern tropics.

136. LIENARDIA SOROR (Sm.).

*Pleurotoma (Glyphostoma) soror*, E. A. Smith, Ann. Mag. Nat. Hist., ser. v, vol. x, 1882, p. 303.

*Clathurella opsimathes*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. VII, vol. xii, 1903, p. 314, pl. xxii, f. 19.

P.G. Bushire, Hinderabi Island, Galig, and Kishm Islands. Gulf of Oman, Muscat, 10-20 fathoms.

M.C. General all along the coast.

I. Karachi Harbour, where the finest specimens of all occur in 5 fathoms, among loose stones and muddy sand.

We merge our *opsimathes* with the type species without much hesitation. In the former the colour is more stramineous and the surface less shining, but the general characters are identical. The type of *opsimathes* came from Shaikh Shuaib Island, Persian Gulf.

137. LIENARDIA SPURCA (Hinds).

*Clavatula spurca*, R. B. Hinds, Moll. Voy. *Sulphur*, 1844, p. 17, pl. v, f. 14.

*Pleurotoma spurca*, Reeve, Conch. Icon., vol. i, 1846, pl. xxxiv, f. 312.

P.G. Linjah Anchorage, 3½ fathoms; Henjam Island, 15-28 fathoms; Bahrein Isles, Mussandam, 55 fathoms; Gulf of Oman, Muscat, 10-15 fathoms; lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

Var. *pasniensis*, nov.

Testa ut in typo, sed omnino albida.

P.G. Gulf of Oman, Pasni.

Live albino shells dredged off the above locality constitute a well-marked colour variety.

The largest examples of this interesting species, surely worthy of a more complimentary cognomen, come from the Linjah Anchorage, and measure long. 14 mm. It is of extended range. Hinds described the type from New Guinea and the Straits of Malacca in 5-18 fathoms, mud. Reeve<sup>1</sup> compares it with *argillacea*, also of Hinds, and from the same locality (Malacca). Judging from the figure it would seem almost identical. The smallest examples of this species that have come under my notice measure long. 9 mm., and are in my possession, labelled "From the Lombe Taylor Coll." Under the name *Clathurella spurca*, Hidalgo admits it to his Philippine Islands list, and Hedley, as *Glyphostoma spurcum*, from Queensland.

Genus CLATHURINA, nom. nov. = CLATHURELLA,<sup>2</sup> Carpenter, 1857,  
DEFRANCIA, Millet, 1826, nom. præoc.

138. CLATHURINA AGLAIA (Melv.).

*Mangilia aglaia*, Melv., Proc. Malac. Soc. Lond., vol. vi, 1904, p. 165,  
pl. x, f. 19.

P.G. Mussandam, 55 fathoms, rarely.

The ochreous, beautifully microscopically decussate third and fourth whorls are to be noted. A very elegant species, closely roundly ribbed and latticed, of which but few examples have come to light. In one specimen the third whorl is angled. The sinus is sutural, rather wide.

139. CLATHURINA ALBICAUDATA (Sm.). (Pl. IX, Fig. 13.)

*Pleurotoma (Defrancia?) albicaudata*, E. A. Smith, Ann. Mag. Nat.  
Hist., ser. v, vol. x, 1882, p. 299.

P.G. Mussandam, 47 fathoms.

I. Karachi. On rocks amongst weeds at low tide.

The author calls attention to the contrast of coloration in this species, the apex and lowest portion of the body-whorl being white and the remainder of the shell rich brown. I have seen no variation in the many specimens examined.

140. CLATHURINA CATHARIA, sp. nov. (Pl. X, Fig. 8.)

C. testa minuta, candida, delicata, ovato-fusiformi, anfractibus 8, quorum apicales  $2\frac{1}{2}$  pallide straminei, globulosi, microscopice arcte cancellati, cæteris costatis, costis rotundatis, crassis, undique spiraliter rudi-liratulis, numero costarum anfractus ultimi 9, lirarum 9, deinde

<sup>1</sup> Conch. Icon., vol. i, 1845, pl. xxv, f. 217.

<sup>2</sup> Mr. T. Iredale informs me that the name *Clathurella* cannot stand, the type being a large fossil, quite unlike the species hitherto grouped under this designation. No other cognomen has yet been proposed, and hence I would suggest *Clathurina*, taking as the type *Cl. foraminata* (Reeve).



superficie ad basim arcte striata, apertura angusta, labro paullum incrassato, columella obliqua, canali recurvo.

(καθάριος, pure.)

Long. 4, lat. 1.5 mm.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

The type is in perfect condition, and only one or two specimens have at present been found. Peculiar for its very rounded, incrassate ribs.

141. CLATHURINA FORAMINATA (Reeve).

*Pleurotoma foraminata*, Reeve, Proc. Zool. Soc., 1845, p. 118.

„ „ Reeve, Conch. Icon., vol. i, 1845, pl. xxxiii, f. 301.

P.G. Gulf of Oman, Muscat, 15 fathoms.

I. Bombay (Abercrombie).

Also reported from Aden (Shopland).

Var. a. *camacina*, Melv.

*Clathurella foraminata*, Reeve, var. *camacina*, Melvill, Mem. Proc. Manch. Soc., vol. xlii, pt. ii, 1898, p. 13, pl. i, f. 15.

P.G. Linjah Anchorage, 3½ fathoms.

I. Karachi.

A large dark form, more elaborate in sculpture than the type.

Var. b. *pyrgodea*, nov. (Pl. X, Fig. 13.)

Testa turrita, major, ad suturas pulehre gradata, anfractibus 8, regularibus, arcte cancellatis, ultimo dorsaliter spiraliter ad basim fossulato, labro fere recto, sinu suturali, lato, canali ad basim recurvo.

Long. 11, lat. 4 mm.

Hab. Mussandam, 55 fathoms.

This may be a monstrosity, but it is very regular in its formation; the deep ridge round the dorsal base of the body-whorl is a characteristic worth attention.

142. CLATHURINA CAVERNOSA (Reeve).

*Pleurotoma cavernosa*, Reeve, Proc. Zool. Soc. Lond., 1845, p. 118.

„ „ Reeve, Conch. Icon., vol. i, 1845, pl. xxxiii, f. 303.

M.C. Charbar, 40 fathoms.

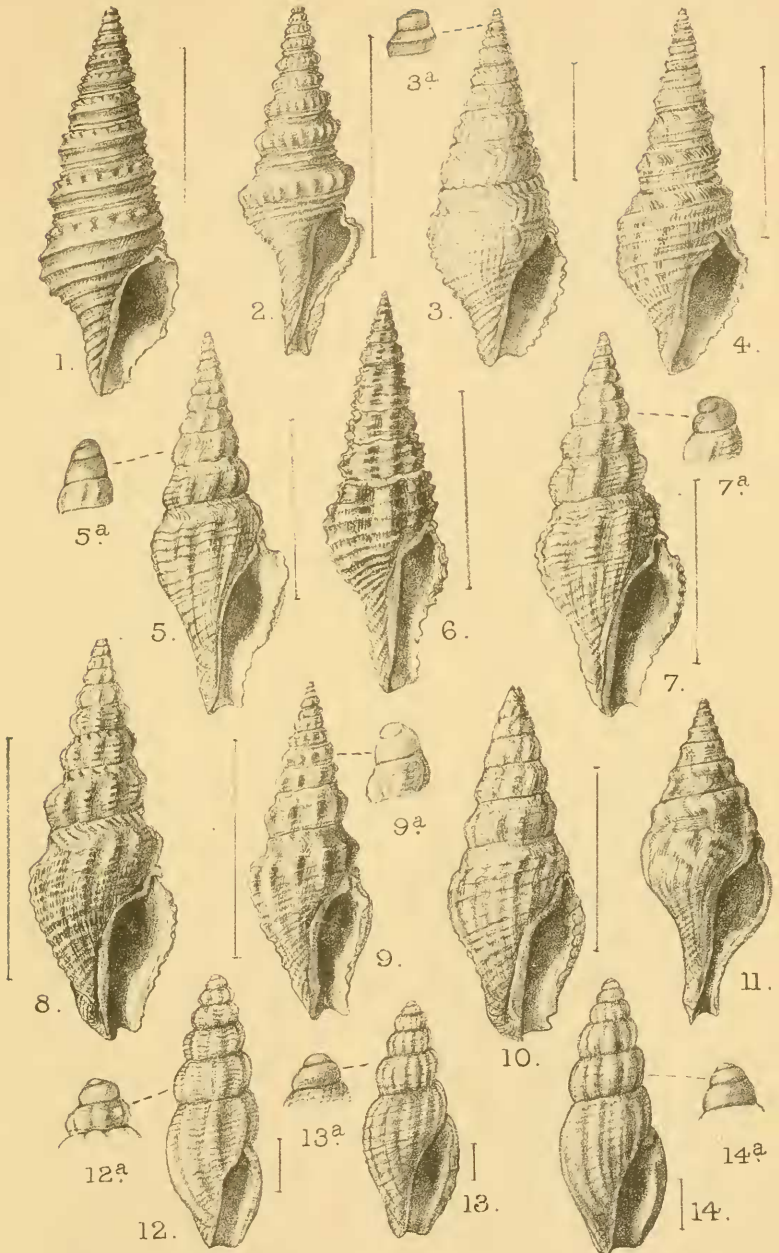
Slight doubt accompanies this determination, for the only three examples seen were in very poor condition. It extends to the Philippines, and Fiji Is. (Andrew Garrett).

143. CLATHURINA EPIXANTHA (Melv.).

*Clathurella epixantha*, Melvill, Proc. Malac. Soc. Lond., vol. vi, 1904, p. 59, pl. v, f. 8.

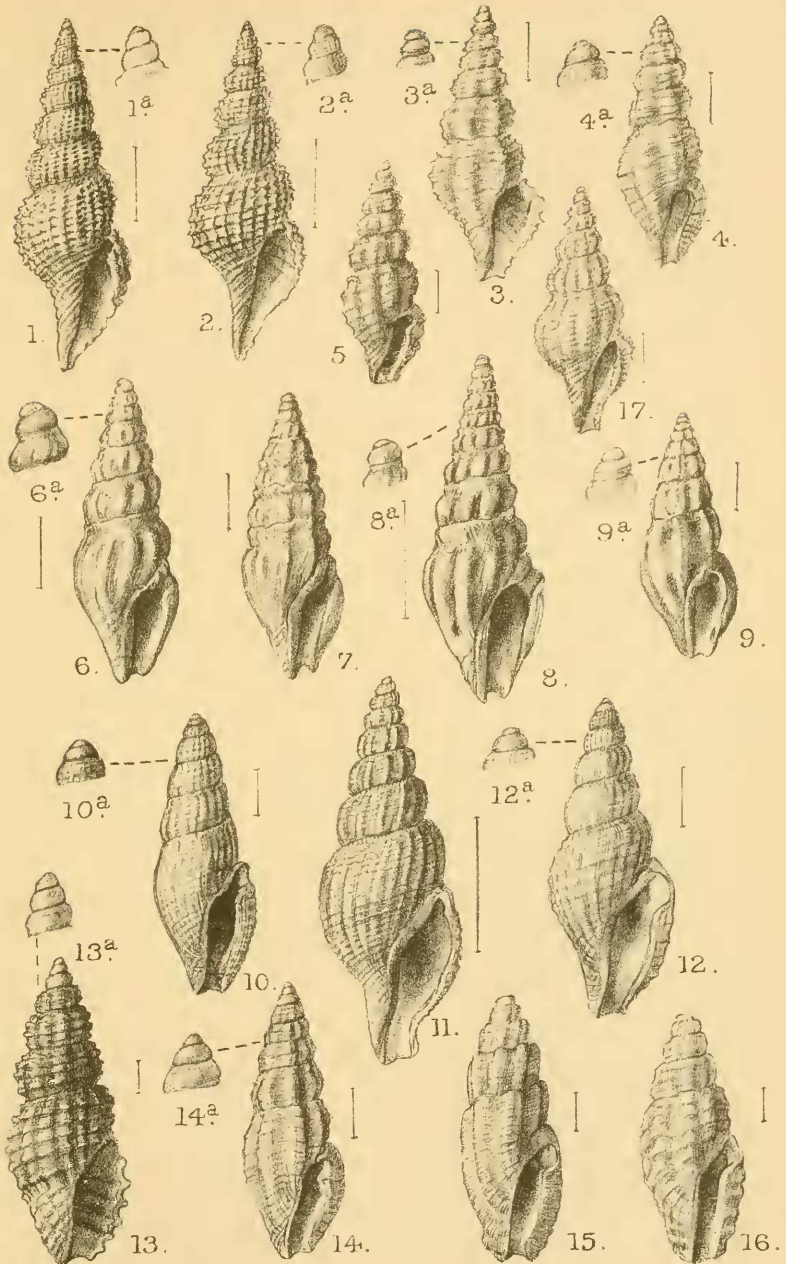
P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms. Also lat. 23° 55' N., long. 57° 48' E., 22 fathoms.

Since the original description was penned I have seen some brighter-coloured examples, tinged with yellow-ochreous. The mouth is particularly wide, and the sinus well expressed. Apical whorls obscurely striate, the acme itself being smooth and vitreous.

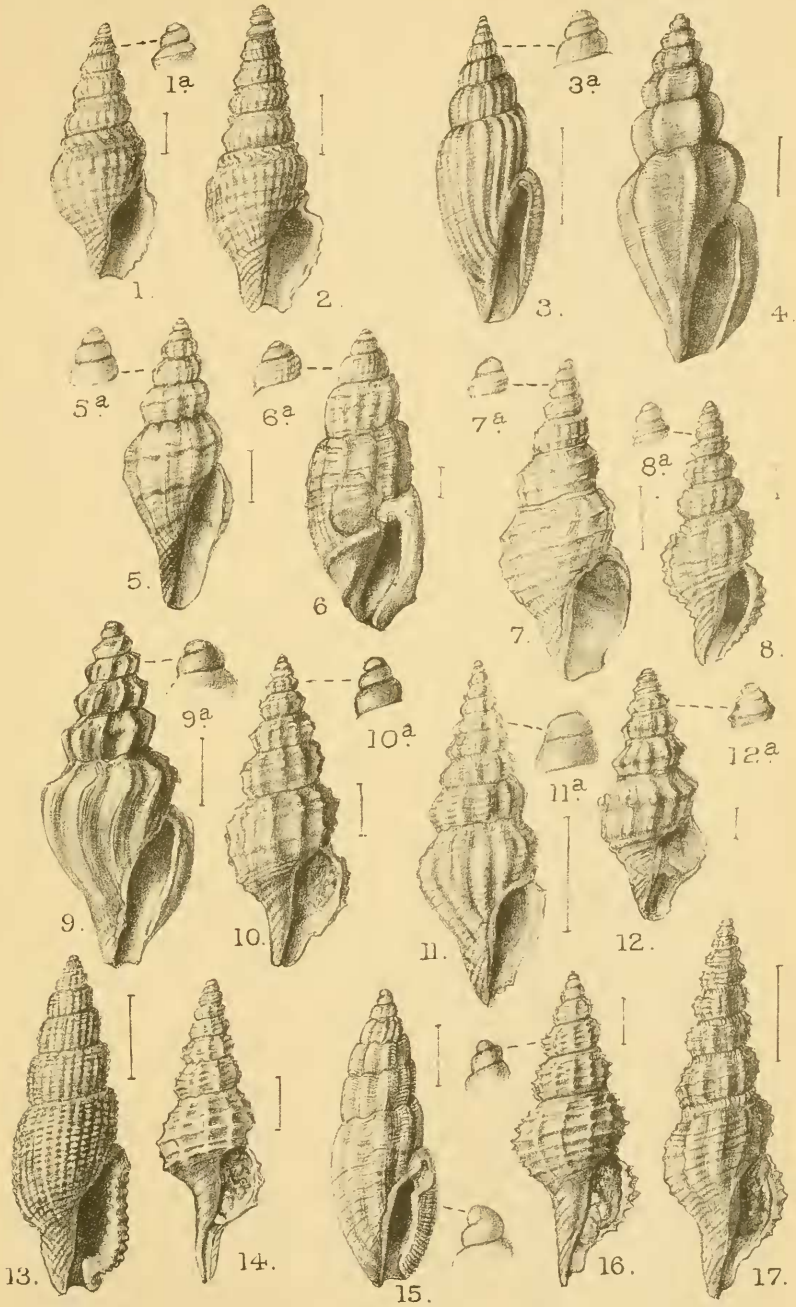


G. M. Woodward, del et litn.

TURRIDÆ OF PERSIAN GULF AND NORTH ARABIAN SEA.



G.M. Woodward, del et lith.



G. M. Woodward, del. et lith.



## 144. CLATHURINA NETRODES, sp. nov. (Pl. X, Fig. 17.)

C. testa longa, gracili, attenuata, delicata, pallide albo-straminea, vel brunnea, infra suturas sparsim spiraliter brunnescente, simul ac infra peripheriam ad basim, anfractibus ad 10, quorum apicales 3, secundo et tertio minutissime sub lente cancellati, cæteris longitudinaliter costulatis, costis paucis, ad ultimum in numero 9, et spiraliter crassiliratis, liris 3-4, penultimo 6, ultimo anfractu ad 9, irregularibus, inde ad basim arcte striato, apertura ovata, sinu haud profundo, parvo, margine columellari fere recto, canali minime producto. Long. 12, lat. 3.50 mm.

(*νήτρον εἶδος*, spindle-, i.e. *Fusus*-shaped.)

Hab. "Persian Gulf," no specified locality.

Only a few examples have yet come to hand of this small but regularly formed species. It much resembles a *Fusus* in miniature, and with a strong lens the small nuclear whorls are seen to be closely cancellate.

## 145. CLATHURINA POLYHYMNIA (Melv.).

*Clathurella polyhymnia*, Melvill, Proc. Malac. Soc. Lond., vol. vi, 1904, p. 165, pl. x, f. 17.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

A distinct form, with many thickened longitudinal costulæ and close spiral lirations, gemmate at the points of junction. All our examples are somewhat apically worn, but a slight cancellation is observable in the third and keeled whorl, the second being also occasionally similarly carinate. Sinus at the suture, wide and well expressed.

## 146. CLATHURINA RECEPTORIA (Melv. &amp; St.).

*Daphnella rectoria*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 448, pl. xxiv, f. 15.

M.C. Charbar.

This large and handsome species has only once occurred. It seems too nearly allied with other carinate *Clathurellæ* not to be relegated to the genus in which, by common consent, they stand.

## 147. CLATHURINA SPANIONEMA, sp. nov. (Pl. X, Fig. 10.)

C. testa alba, parva, fusiformi, delicata, tenui, anfractibus 8, quorum apicales duo vitrei, globulosi, tertio sub lente pulchre cancellato, cæteris 5 apud suturas impressis, tribus supernis ad medium angulatis, undique longitudinaliter crassicostatis, numero ultimum apud anfractum duodecim, spiraliter liris paucis accinctis, ad juncturas gemmatis, apertura ovata, labro tenui, sinu obscuro, canali paullum prolongato, columella recta. Long. 8, lat. 3 mm.

(*σπάνιος νήμα*, with scanty threads or liræ.)

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

A small delicate species, white, eight-whorled, the third apical being beautifully cancellate. This point is unfortunately not well brought out in our illustration. The ribs are incrassate, spiral liræ few, in the last whorl they are absent just in the centre, the canal is prolonged somewhat, outer lip thin, columella straight.

148. *CLATHURINA TENUILIRATA* (Angas).

*Clathurella tenuilirata*, G. F. Angas, Proc. Zool. Soc. Lond., 1871,  
p. 17, pl. i, f. 18.

„ „ „ Tryon, Man. Conch., vol. vi, 1884, p. 281,  
pl. xxvii, f. 8, 9.

P.G. Gulf of Oman, lat. 26° 10' N., long. 82° 50' E., 33 fathoms,  
mud and rock.

I have not been able to find the species so named from the locality just given. *C. tenuilirata*, Angas, type, was from Port Jackson, New South Wales, and it is unlikely this species occurs in the Persian Gulf area, but since it was thus named for Mr. Townsend by Mr. Edgar Smith, I do not feel justified in excluding it from this enumeration without more proof.

149. *CLATHURINA TINCTA* (Reeve).

*Pleurotoma tincta*, Reeve, Proc. Zool. Soc., 1846, p. 5.

„ „ „ Conch. Leon., vol. i, 1846, pl. xxxviii, f. 347.

P.G. Bushire. Gulf of Oman, Muscat, 2-8 fathoms.

I. Karachi; occurs at very low tide, amongst mud and weed on  
rocks. Bombay (Abercrombie).

Var. *lemniscata*, G. & H. Nev.

*Clathurella lemniscata*, G. & H. Nevill, Journ. As. Soc. Bengal,  
vol. xlv, 1875, pt. ii, p. 92, pl. vii, f. 11.

P.G. Bahrein Island.

M.C. Gwadûr (W. T. Blanford).

I. Bombay (Abercrombie), with the type in shell-sand; also  
Rev. S. B. Fairbank, *secus* G. & H. Nevill.

Seemingly only differing in the continuous brown band below the sutures. The figure given by Nevill as quoted above is from a Mauritian type. It is also reported from Ceylon. The typical form is widely distributed throughout the eastern tropics.

§ Subgen. *VEPRECUA*, nov.

Shell small, thin, delicate, pale brown or white, fusiform, spire either very attenuate, or pagodiform, or broader, and ventricose, always much suturally impressed; whorls 10-12, the nuclear being 4-5, the first of these smooth, the second to the fourth or fifth very finely longitudinally radially costulate, the remainder either few or closely ribbed, crossed by frequent or more distant lirations, acutely echinate at the points of junction, interstices appearing deeply seated, almost smooth, quadrate or oblong, mouth oblong, outer lip thin, sinus deep and wide, situate immediately below the suture. Canal produced, fusiform.

(*Veprecula*, dim. of *vepres*, a little thorn, from the echinate ribs.)

Type.—*Veprecula sykesii* (Melv. & St.).

This sub-genus of *Clathurina*, which I now venture to propose, consists of a few abysmal species with a strong resemblance to each



other, five in number, distributed over a great portion of the eastern tropics, having been noticed in Japan (A. Adams), Australia (Hedley), Persian Gulf and Gulf of Oman (Townsend). A superficial resemblance may be traced through such a species as *Cl. pseudohystrix*.<sup>1</sup> (Sykes), better known by the name of *hystrix* (Jan). In this species, as in so many true Clathurinæ, the nuclear whorls are bulbous, vitreous, closely spirally microscopically striate or cancellate.

150. CLATHURINA (VEPRECUA) ASPERULATA (Sm.). (Pl. IX, Fig. 1.)

*Pleurotoma* (*Defrancia*?) *asperulata*, E. A. Smith, Ann. Mag. Nat. Hist., ser. v, vol. x, 1882, p. 296.

P.G. Coll. Pelly. (Type in the British Museum.)

Differs from *Cl. reticulosa* (Sm.), according to the author (loc. cit., p. 297), by its longer spire, narrower form, closer reticulation, and smooth apical whorls. All the species seem very nearly allied. Also reported from Japan.

This does not occur in the Townsendian gatherings. I can hardly separate it from its too near ally, *Cl. reticulosa*. In my opinion, the apical whorls of the type (here figured) are worn, and the fine delicate radiate ribs obliterated. Should it be decided in future to unite these two species, both described in the same paper, the present species has precedence by one page.

151. CLATHURINA (VEPRECUA) HEDLEYI (Melv.). (Pl. X, Fig. 16.)

*Clathurella hedleyi*, Melvill, Proc. Malac. Soc. Lond., vol. vi, 1904, p. 59, pl. v, f. 9.

P.G. Mussandam, 47 fathoms. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

This species differs from its congeners in its greater ventricosity and roundness of whorl, the number of longitudinal costæ on the body-whorl is sixteen in the specimen figured, the spiral acute lirations are also more frequent than obtain in *sykesii* or *vepratica*. The apical whorls are microscopically longitudinally costellate, four in number. The type possesses a greater number of ribs than obtains in the more recently collected examples, but I cannot further separate them specifically.

152. CLATHURINA (VEPRECUA) RETICULOSA (Sm.). (Pl. IX, Fig. 2.)

*Pleurotoma* (*Defrancia*) *reticulosa*, E. A. Smith, Ann. Mag. Nat. Hist., ser. v, vol. x, 1882, p. 297.

P.G. Coll. Pelly. (Type in the British Museum.) Henjam Island, one or two specimens dredged at 40 fathoms.

Under *Cl. asperulata* its close affinity with the present species was mentioned, as the figures will also show. Besides the alleged difference in the nepionic whorls (*reticulosa* having the fine radial ribs which certainly obtain in the three other species now relegated to this section) the author states that *reticulosa* may be known by

<sup>1</sup> Proc. Malac. Soc. Lond., vol. vii, 1906, p. 187.

“the smooth furrow at the top of the whorls, the reticulated surface, and the rather produced canal”. But, surely, two of these three characteristics are also present in *asperulata*, and as regards the third, the furrow at the top of the whorls seems very much the same in each. However, I keep them distinct at present out of regard for the author. Both these species are also reported from Japan.

153. CLATHURINA (VEPRECUA) SYKESII (Melv. & St.).

*Clathurella sykesii*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. VII, vol. xii, 1903, p. 314, pl. xxiii, f. 4.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

Abundant locally, in the dredging just mentioned, all the specimens being dead, and often fragmentary. The species is almost an exact replica in miniature of a typical *Fusinus*, so far as the contour is concerned. It is extremely narrow, and the longitudinal ribs on the body-whorl number only eight. The nepionic whorls are of the same character as those of *vepratrica* and *reticulosa*.

154. CLATHURINA (VEPRECUA) VEPRATICA (Hedley). (Pl. X, Fig. 14.)

*Pleurotoma vepratrica*, C. Hedley, Mem. Austral. Mus., vol. iv, 1903, p. 384, pl. vi, f. 97.

*Pleurotomella* ,, ,, Rept. Australasian Assoc., vol. xii, 1910, p. 365.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

M.C. Charbar, 40 fathoms.

When, in 1904, I described *Cl. hedleyi*, I alluded to the fact of *Cl. vepratrica* (Hedl.) being almost exactly intermediate between that species and *Cl. sykesii* (Melv. & St.). There can be no doubt of this; and now that all three species are found together in the same seas, the question may be asked whether they are not varietal. I hardly think so: the extremely attenuate *sykesii*, with only 8 costæ on the body-whorl, the far more tumid and ventricose *hedleyi*, with 14 or occasionally 16, and the slightly angular *vepratrica*, stouter than *sykesii*, but attenuate in comparison with *hedleyi*, and 10-11 ribbed, always seem fairly easily separable. The nepionic whorls are very similar. But few of those we have been able to examine of any of the species are quite perfect, but many show three whorls, all very finely costulate. I have in my possession, from the Arthur Adams collection of Japanese shells, one example in perfect condition, of what I consider this species. Mr. Hedley's figure, as quoted above, should be consulted. This type has a five-whorled nepionic apex.

The species came from Australia, off Port Kemble, 63-75 fathoms; Botany Bay, 50-2 fathoms; off Cape Three Points, 41-50 fathoms; also off Cabbage Tree Island in 1880; and it is likewise recorded from the Torres Straits (Hedley). It seems to me that the peculiar nuclear whorls preclude the genus *Pleurotomella* being seriously considered for this species, as suggested in 1909 by its author, in his enumeration of Queensland shells.

Genus DAPHNELLA, Hinds, 1844.

155. DAPHNELLA AXIS (Reeve).

*Pleurotoma axis*, Reeve, Proc. Zool. Soc. Lond., 1846, p. 3.

” ” ” Conch. Icon., vol. i, 1846, pl. xxxiv, f. 311.

Muscat, 20-40 fathoms, large dead specimen.

P.G. Malcolm Inlet, 20 fathoms; Kais (or Gais) Island, 10 fathoms, amongst broken shell and coral sand. Gulf of Oman, lat.  $24^{\circ} 55' N.$ , long.  $57^{\circ} 5' E.$ , 37 fathoms.

I. Karachi.

A large, handsome species, spirally acutely lirated, tornate, with no cancellations.

Reported from Queensland by Hedley, and, under name *Clathurella axis*, from the Philippines by Hidalgo, and also Reeve, as collected by Hugh Cuming.

156. DAPHNELLA BUCCINULUM, M. & St.

*Daphnella buccinulum*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. VII, vol. xii, 1903, p. 317, pl. xxiii, f. 9.

P.G. Gulf of Oman, lat.  $24^{\circ} 58' N.$ , long.  $56^{\circ} 54' E.$ , 156 fathoms.

A very inflated species, thin, and delicately very finely cancellate throughout, the body-whorl extending to two-thirds of the total length.

157. DAPHNELLA CECILIE, M. & St.

*Daphnella cecilie*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 447, pl. xxiv, f. 13.

M.C. Without exact locality.

An almost unique species. Allied to *D. subula*, Reeve, of which it perhaps may be a variety, but is pure white, immaculate, finely cancellate on the uppermost whorls. It received its name in honour of Miss Cecilia Sturt, daughter of Mr. W. Neville Sturt, who received the type direct from Mr. F. W. Townsend in 1904-5.

158. DAPHNELLA DEA, Melv.

*Daphnella dea*, Melvill, Proc. Malac. Soc. Lond., vol. vi, 1904, p. 167, pl. x, f. 24.

P.G. Gulf of Oman, lat.  $24^{\circ} 58' N.$ , long.  $56^{\circ} 54' E.$ , 156 fathoms.

Resembling *D. thia*, Melv. & St., but far finer in its cancellations, a species hardly to be excelled in that particular, bearing all the characteristics of an abysmal form.

159. DAPHNELLA EUPHROSYNE, Melv. & St.

*Daphnella euphrosyne*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. VII, vol. xii, 1903, p. 318, pl. xxiii, f. 12.

P.G. Gulf of Oman, lat.  $24^{\circ} 58' N.$ , long.  $56^{\circ} 54' E.$ , 156 fathoms.

Nearest to *D. subula*, Reeve, also occurring in these seas. It is, however, pure white throughout, with none of the sutural orange-brown maculation of the kindred species; the sculpture, however,

particularly of the upper whorls, is very similar. *D. cecilia*, Melv. & St., is also a very near ally, but in this species the spiral lines are more prominent, as shown in the illustration quoted above.

160. *DAPHNELLA EVERGESTIS*, Melv. & St.

*Daphnella evergestis*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 447, pl. xxiv, f. 14.

P.G. Gulf of Oman, lat.  $24^{\circ} 55' N.$ , long.  $59^{\circ} 59' E.$ , 37 fathoms, sand and coral mud.

A many-ribbed, elegantly cancellate species, of which but few specimens were found.

161. *DAPHNELLA HEDYA*, Melv. & St.

*Daphnella hedy*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. VII, vol. xii, 1903, p. 318, pl. xxiii, f. 11.

P.G. Shaikh Shuaib Island, 15 fathoms.

This delicate mottled species, tinted towards the base with crimson-brown, has not since occurred. The whorls are very finely decussately cancellate, gemmulate at the points of junction. Some of the upper whorls are variciferous.

162. *DAPHNELLA LUCASII*, Melv.

*Daphnella lucasii*, Melvill, Proc. Malac. Soc. Lond., vol. vi, 1904, p. 167, pl. x, f. 25.

P.G. Gulf of Oman, lat.  $24^{\circ} 58' N.$ , long.  $56^{\circ} 54' E.$ , 150 fathoms.

A more effuse, inflated species than most of its congeners, in form like a minute *Fasciolaria*, banded over the whole surface with spiral raised liræ, occasionally somewhat interrupted, the apical whorls beautifully decussate, outer lip very effuse, canal recurved, slightly produced. It is named in honour of Mr. Bernard R. Lucas of Warrington, Cheshire, who has rendered me during many years most beneficent and generous service in sorting these minute organisms out of the mixed mass of dredged material.

163. *DAPHNELLA MACANDREWII* (Sm.). (Pl. IX, Fig. 11.)

*Pleurotoma (Daphnella) macandrewi*, E. A. Smith, Ann. Mag. Nat. Hist., ser. v, vol. x, 1882, p. 302.

P.G. Muscat, 15-22 fathoms; Mussandam, 47-55 fathoms; Malcolm Inlet (Kubbatt Ghazira), 55 fathoms; Henjam Island (1906).

Gulf of Oman, lat.  $24^{\circ} 58' N.$ , long.  $56^{\circ} 54' E.$ , 156 fathoms. Kuh i Mubarik. Daimaniyat Isles, 100 miles south of Jask (1912).

I. A broken specimen in the Abererombie collection from Bombay. Its nearest ally is *D. veneris*, Melv. & St., a gradate shell, much more abbreviate in contour, with canal not so prolonged.

## 164. DAPHNELLA OMALEYI (Melv.).

*Clathurella omaleyi*, Melvill, Ann. Mag. Nat. Hist., ser. VII, vol. iv, 1899, p. 88.

P.G. Mussandam, 55 fathoms; Henjam Island (1906); Gulf of Oman; Kuh i Mubarik, 45 fathoms.

Telegraph Cable, lat.  $25^{\circ} 58' N.$ , long.  $57^{\circ} 05' E.$ , at 50 fathoms, amongst various shell growth.

M.C. Charbar, 40 fathoms.

This species was at first classed as a *Clathurella*, owing to supposed kinship with such a species as *Cl. robillardi*,<sup>1</sup> H. Adams, but the costæ are of a different and more irregular character. Superficial likeness to *Mangilia galigensis*, Melv., and *M. townsendi*, Sby., prevails, but the protoconch of our species is mostly delicately decussately cancellate, and the characters of the prolonged canal and outer lip decide us to place it in the genus *Daphnella*. It is a most delicate and beautiful shell, very regularly paucicostate, shining, the whorls crossed with very fine spiral striæ, gemmulate at the points of junction with the ribs. It was named in honour of Julian Adrian O'Maley, formerly of the Indian Government Telegraph Service, who died at Manchester in 1913, aged 48. He had taken great interest and part in the Persian Gulf dredgings.

## 165. DAPHNELLA SABRINA, Melv.

*Daphnella sabrina*, Melvill, Proc. Malac. Soc. Lond., vol. vii, 1906, p. 17, pl. vii, f. 22.

P.G. Gulf of Oman, lat.  $24^{\circ} 58' N.$ , long.  $56^{\circ} 54' E.$ , 156 fathoms.

Extremely highly sculptured, with many spiral carinæ, one being especially conspicuous at the periphery, the cross cancellations are pronounced and fine, the apical whorls ochreous, minutely decussate.

## 166. DAPHNELLA SATURATA (Reeve).

*Pleurotoma saturata*, Reeve, Conch. Icon., vol. i, 1845, pl. xxiv, f. 213.

" " " Proc. Zool. Soc. Lond., 1845, p. 113.

P.G. Muscat, 10–20 fathoms, and again at 40 fathoms.

A finely sculptured shell, conspicuous for a white somewhat raised band at the periphery of the body-whorl, and adorned with other minor spiral bands. The coloration is a deepish brown, outer lip crenulate, canal slightly recurved. The type came from Corrigidor Island, Philippines (coll. Cuming). See remarks under the next species.

## 167. DAPHNELLA SUBULA, Reeve.

*Daphnella subula*, Reeve, Proc. Zool. Soc. Lond., 1845, p. 113.

" " " Conch. Icon., vol. i, 1845, pl. xxiv, f. 211.

P.G. Gulf of Oman, lat.  $26^{\circ} 10' N.$ , long.  $52^{\circ} 50' E.$ , 33 fathoms, sand and mud.

M.C. Charbar Point, on rocks at 7–12 fathoms.

Astola Island, on rocks and algæ.

<sup>1</sup> Proc. Zool. Soc. Lond., 1869, p. 272, pl. xix, fig. 2.

This species and *D. saturata* (Reeve) were discovered at the same time and place (Corrigidor Island, Philippines) by Mr. Hugh Cuming, at a depth of 7 fathoms. Both are probably widely diffused throughout the eastern tropics. *D. subula* has a characteristic style of painting, as well as sculpture, and is well figured as given above. It is possible that our *D. euphrosyne* may be a more delicate, colourless, deep-water variety. Also reported from Queensland (Hedley).

168. DAPHNELLA TETARTEMORIS (Melv.).

*Mangilia tetartemoris*, Melvill, Ann. Mag. Nat. Hist., ser. VIII, vol. vi, 1910, pl. ii, f. 24.

M.C. Off Astola Island, at 90 fathoms.

A near ally of *D. omaleyi* (Melv.), differing in its quadrate sculpture, two acute keels existing on the lower whorls, one on the upper, crossing six remote yet regular ribs. The nuclear whorls are delicately decussately cancellate.

169. DAPHNELLA THIA, M. & St.

*Daphnella thia*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. VII, vol. xii, 1903, p. 316, pl. xxiii, f. 8.

P.G. Shaikh Shuaib Island, 15 fathoms.

Gulf of Oman, lat.  $24^{\circ} 58' N.$ , long.  $56^{\circ} 54' E.$ , 156 fathoms.

A beautiful and delicate *Daphnella*, with a yellowish or golden tinge over the whole semi-pellucid surface. The decussating lira are not so close as is the case in *D. buccinulum*, M. & St., or *dea*, Melv., but nevertheless very fine. The body-whorl is fairly tumid, spire slightly elongate, canal produced.

170. DAPHNELLA THYGATRICA, M. & St.

*Daphnella thygatraca*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. VII, vol. xii, 1903, p. 316, pl. xxiii, f. 6.

P.G. Gulf of Oman, lat.  $24^{\circ} 58' N.$ , long.  $56^{\circ} 54' E.$ , 156 fathoms.

A peculiar shell, doubly keeled on the body-whorl, straw-coloured, with pale-red flame-ornamentation. It occurred only in the locality above given.

171. DAPHNELLA TRIVARICOSA, v. Mart.

*Daphnella trivaricosa*, E. von Martens, in Moebius, Beitr. Meeresf. Insel Mauritius, 1880, p. 228, pl. xx, f. 1.

P.G. Malcolm Inlet. Gulf of Oman, locality not specified.

The uppermost whorls are strongly variced, the lower ones usually plain. This species only occurred in one dredging.

172. DAPHNELLA VENERIS, M. & St.

*Daphnella veneris*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 449, pl. xxiv, f. 16.

P.G. Gulf of Oman, lat.  $24^{\circ} 05' N.$ , long.  $57^{\circ} 25' E.$ , 205 fathoms; lat.  $25^{\circ} 04' N.$ , long.  $60^{\circ} 06'$ , 60 fathoms.



Off Muscat, 20 fathoms (1907).

The nearest ally to this finely sculptured species seems to be *D. macandrewi* (Smith), from which it can readily be distinguished. The lower whorls are rarely variced (see remarks under this last-named species).

173. *DAPHNELLA XYLOÏS*, M. & St.

*Daphnella xyloïs*, Melvill & Standen, Proc. Zool. Soc. Lond., 1901, p. 449, pl. xxiv, f. 17.

P.G. Muscat, 10–20 fathoms, coral sand.

The nuclear, finely cancellate, whorls are ochreous tinted. Whole shell closely reticulate. When in live condition much tinted with dark-brown markings. Near *D. thia*, M. & St., which is a more coarsely grained species.

§ Subgen. *DIAUGASMA*, nov.

Shell minute, oliviform, smooth or microscopically spirally striolate, mainly on each side of the sutures, leaving the central portion of the whorl plain, in form cylindrical or elongate, compact, only slightly impressed at the sutures, nuclear whorls closely and very finely cancellate, whorls semi-pellucid, unicolorous white, or flecked with pale stramineous, mouth narrowly oblong, outer lip nearly straight, slightly thickened, sinus hardly expressed.

(*διαύρασμα*, transparency, from its vitreous appearance.)

174. *DAPHNELLA (DIAUGASMA) EPICHARTA* (M. & St.).

*Daphnella epicharta*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. VII, vol. xii, 1903, p. 317, pl. xxiii, f. 10.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

This little species, which is in length but 5 mm., seems to appertain, with one or two others, to a distinct and peculiar section of *Daphnella*, so I now propose a new subgeneric title for it. *Pleurotoma olyra* and *vitrea*, both of Reeve,<sup>1</sup> judging by figure and description, are nearly allied, and would probably be included in the same category. The first of these, *olyra*, comes nearest to *epicharta*. It can be distinguished by its much larger size, say 11 mm. long, aperture wider, shorter spire, and pink-tipped apex. It is likewise semi-transparent, and the very delicate spiral striation across the whorls is represented by the author as sometimes evanescent altogether. *Pl. vitrea* is also, as its name would imply, glassy and pellucid, smooth centrally, but spirally striate, as is *epicharta*, round the sutures. This is a more elongate shell, 8 mm. in length, whorls slightly ventricose, outer lip expanded, and came from Singapore and Mindanao Island, Philippines (Cuming). *D. epicharta* is more oliviform, and might also easily be mistaken for a species of *Æsopus*, but there can be no doubt of its pleurotomid character.

<sup>1</sup> Conch. Icon., vol. i, 1845, pl. xxiv, f. 207, and pl. xxxiii, f. 300.

## Genus PLEUROTOMELLA, Verrill, 1873.

Usually considered to be a section of *Daphnella*, but I think it may be raised to generic rank. The species possess a common "facies" wherever they are found. The shell is as a rule more or less turreted or gradate.

## 175. PLEUROTOMELLA ALCESTIS (Melv.).

*Daphnella* (*Pleurotomella*) *alcestis*, Melvill, Proc. Malac. Soc. Lond., vol. vii, 1906, p. 78, pl. viii, f. 23.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

Allied to *Pl. amphiblestrum*, Melv., and *eulimenes*, Melv., but more fusiform in contour, with regular quadrate decussate sculpture, mouth oblong, canal slightly produced. Colour pure white.

## 176. PLEUROTOMELLA AMPHIBLESTRUM (Melv.).

*Clathurella amphiblestrum*, Melvill, Proc. Malac. Soc. Lond., vol. vi, 1904, p. 18, pl. v, f. 7.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

It is often difficult to draw a hard and first line between the Clathrinæ and certain outlying Daphnelloid species, and this is a case in point. *Pl. amphiblestrum* is a somewhat coarsely cancellate species, the nuclear whorls ochreous, very finely and beautifully decussate. The anal sinus is very distinct, coming just below the suture. It seems comparable with *Daphnella brazieri*, Angas,<sup>1</sup> an Australian species, well figured by Hedley,<sup>2</sup> but this species is inclined to be slightly shouldered at the upper part of the whorls.

## 177. PLEUROTOMELLA AMPHITRITES (M. &amp; St.).

*Daphnella* (*Pleurotomella*) *amphitrites*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. vii, vol. xii, 1903, p. 316, pl. xxiii, f. 3.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

Found with *Pl. nereidum* (M. & St.), which differs from it in greater angularity of whorl and less obesity of contour. Both are pure white, delicately chased shells, of considerable beauty.

## 178. PLEUROTOMELLA EPHORA (Melv.).

*Mangilia ephora*, Melvill, Proc. Malac. Soc. Lond., vol. vi, 1904, p. 58, pl. v, f. 5.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

The projecting spiral ridge encircling the body-whorl amply characterizes this peculiar little species. The nuclear whorls are beautifully cancellate; sinus but lightly expressed.

## 179. PLEUROTOMELLA EULIMENES (Melv.).

*Daphnella eulimenes*, Melvill, Journ. of Malac., vol. xi, 1904, p. 84, pl. viii, f. 15.

P.G. Gulf of Oman, lat. 24° 08' N., long. 56° 54' E.; 156 fathoms.

A graceful species, of rare occurrence at the above very prolific

<sup>1</sup> Proc. Zool. Soc. Lond., 1871, p. 18, pl. i, f. 22.

<sup>2</sup> Mem. Austral. Mus., iv, pt. 6, 1903, p. 392, f. 107.

locality. The whorls are once conspicuously but slopingly angled below the sutures. Colour pure white. Eulimenes was one of the sea-nymphs or Nereids of mythology.

180. PLEUROTOMELLA EVADNE, Melv.

*Pleurotomella evadne*, Melvill, Proc. Malac. Soc. Lond., vol. x, 1912, p. 252, pl. xii, f. 18.

P.G. Mussandam, 55 fathoms.

Curiously and unusually abbreviate, indeed almost round, the nuclear whorls finely decussate, outer lip slightly effuse, canal short. Quite buccinoid superficially. A rare species.

181. PLEUROTOMELLA HYPERMNESTRA, Melv.

*Pleurotomella hypermnestra*, Melvill, Proc. Malac. Soc. Lond., vol. x, 1912, p. 253, pl. xii, f. 19.

P.G. Mussandam, 55 fathoms.

Near *Pl. amphiblastum* (Melv.), or especially *Pl. eulimenes* (Melv.), from the same seas. Its sculpture is finer than the former, and the longitudinal ribs only half the number of those obtaining in the latter species. The sinus is well expressed, apical whorls cancellate.

182. PLEUROTOMELLA ITAMA (Melv.).

*Daphnella* (*Pleurotomella*) *itama*, Melvill, Proc. Malac. Soc. Lond., vol. vii, 1906, p. 78, pl. viii, f. 24.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

This small species is of very different character to the others at present associated with it, though when examined with a high power it will be seen to possess many kindred qualities—the beautifully cancellate ochreous protoconch, incrassate riblets, crossed by close spiral liræ, canal slightly prolonged.

An Arctic species, named *Defrancia formosa* by Jeffreys,<sup>1</sup> is, judging by the figure, of much the same character.

183. PLEUROTOMELLA NEREÏDUM (M. & St.).

*Daphnella* (*Pleurotomella*) *nerëidum*, Melvill & Standen, Ann. Mag. Nat. Hist., ser. vii, vol. xii, 1903, p. 315, pl. xxiii, f. 2.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

This is comparable with *Daphnella vestalis*, Hedley, an equally exquisite form, the sinus in both is non-existent, and the ornamentation and shape very similar. Our species is the coarser of the two, and the whorls more sharply angled.

184. PLEUROTOMELLA RHYTISMEIS, Melv.

*Pleurotomella rhytismeis*, Melvill, Ann. Mag. Nat. Hist., ser. viii, vol. vi, 1910, p. 14, pl. ii, f. 25.

P.G. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms.

The wrinkled sculpture and strong median peripheral angulation distinguish this small white species. Only a specimen or two have been yet found.

<sup>1</sup> Proc. Zool. Soc. Lond., 1883, p. 397, pl. xlv, f. 9.

## EXPLANATION OF PLATES VIII-X.

## PLATE VIII.

FIG.

1. *Turris* (*Tomopleura*) *acutigemmata* (Sm.).
2. *Surcula nellicæ* (Sm.).
3. *Turris* (*Gemmula*) *multiseriata* (Sm.).
4. *T.* (*Tomopleura*) *vertebrata* (Sm.).
5. *Drillia incerta* (Sm.).
6. *D. intertincta* (Sm.).
7. *D. crenularis* (Lam.), var. *atkinsonii*, Sm.
8. *D. variabilis*, Sm.
9. *D. baynhami* (Sm.).
10. *D.* (*Tylotia*) *crassa* (Sm.).
11. *Surcula fulminata* (Kien.), var. *gloriosa*, nov.
12. *Mangilia fortistriata* (Sm.).
13. *M. albolabiata* (Sm.).
14. *M. decipiens* (Sm.).

## PLATE IX.

1. *Clathurina* (*Vepracula*) *asperulata* (Sm.).
2. *C.* (*Vepracula*) *reticulosa* (Sm.).
3. *Mangilia albata* (Sm.).
4. *M. scitula* (Sm.).
5. *M. munda* (Sm.).
6. *Drillia persica* (Sm.).
7. *D. lucida*, G. & H. Nev.
8. *D. persica* (Sm.), var. *jacintha*, nov.
9. *M. pellyi* (Sm.).
10. *M. arcta* (Sm.).
11. *Daphnella macandrewi* (Sm.).
12. *Mangilia gracilentia* (Reeve), var. *portia*, Sm.
13. *Clathurina albicaudata* (Sm.).
14. *Mangilia heptagona* (Dkr.).
15. *M. horneana* (Sm.).
16. *M. lucida* (Sm.).
17. *Lienardia crebrilirata* (Sm.).

## PLATE X.

1. *Drillia inconstans* (Sm.).
2. *D. pyramidula* (Reeve).
3. *Cythara lyrica* (Reeve).
4. *C. striatella*, Sm.
5. *Mangilia tritæniata*, sp. nov.
6. *M. erymna*, sp. nov.
7. *M. olivieriana*, sp. nov.
8. *Clathurina catharia*, sp. nov.
9. *Mangilia woodwardiæ*, sp. nov.
10. *Clathurina spanionema*, sp. nov.
11. *Drillia chimastrum*, sp. nov.
12. *Mangilia callicredemma*, sp. nov.
13. *Clathurina foraminata* (Reeve), var. *pyrgodea*, nov.
14. *C.* (*Vepracula*) *vepraticea* (Hedley).
15. *Mangilia horneana* (Sm.), var. *compar*, nov.
16. *Clathurina* (*Vepracula*) *hedleyi*, Melvill.
17. *C. netrodes*, sp. nov.

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